Diskit 2 Plus™

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Information on warranty service is in the appendix on Customer Support at the end of this manual.

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Notice

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Warranty and Support Information

IDEAssociates has an established network of computer dealers throughout the United States and Europe. To place an order or to locate the nearest dealer, call nationwide at (800) 257-5027.

IDEAssociates supports Diskit 2 Plus on the IBM PC, XT, and AT Computers.

Customer Survey Form

Product: Diskit 2 Plus
Revision 0

1. Were there any errors in the manual? If yes, list page numbers and kind of error:

2. Was information: easy to understand___ difficult___

   List information that was hard to find:

3. Was information: complete___ incomplete___

4. What features of the product did you particularly like?

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5. What features would you like to see added to the product in future revisions?

6. Compared to similar manuals, how would you rate the documentation?
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Worse than most___

7. Please rate your knowledge of personal computers: Experienced___
Some previous use___ First-time user___

8. Please use the rest of this page for additional comments.

Section I:

Introduction to Diskit 2 Plus

Diskit 2 Plus(tm) is a revolutionary concept in hard disks. It is a compact external disk drive with twin 10MB removable Winchester cartridges, designed to be easily installed by the user. For users trying to get back their desk space, Diskit 2 Plus provides an answer.

Like all IDEA drives, this product provides great storage capacity at higher speeds than floppy disks, and is fully compatible with IBM PC DOS as well as with other IDEA products. It provides online storage and backup in one unit and uses the space underneath the PC monitor. DES hardware based encryption assures the security of removable cartridges for backup and data protection.

Diskit 2 Plus has many applications in an office environment. Examples include:

- A financial planner uses the IBM AT for sophisticated spreadsheet analyses and projections of sales and expenses. Diskit 2 Plus provides both sufficient storage for spreadsheet data and backup after new data entry.

- A marketing manager uses a database query language to track sales by product and by region. Diskit 2 Plus provides storage, and the cartridges with sales figures can be removed from the drive and stored in a locked area when not in use.

- Several manufacturing employees share a disk over the IDEAnet network. They use the same data files to track orders, deliveries, and supplies on hand.

- By using encryption, cartridges containing sensitive data can be shipped without fear of decoding en route.

Diskit 2 Plus is designed for ease of installation. Hardware connections are simple and are fully explained in this manual.

Software is simple and user-friendly. Users need only type the command INSTALL to get the drive tested, running, and bootable. For day-to-day maintenance or preparation of new disk cartridges, the utility DUTIL is equally straightforward. Both utilities provide clear menus and prompts for all functions.

Enjoy your IDEA product!

Organization of Manual

Section I:	is an introduction to Diskit 2 Plus
Section II:	describes hardware installation and setting the jumpers
Section III:	contains information on running the INSTALL program and a chart of the INSTALL steps
Section IV:	provides information on backup procedures, using DOS commands, and creating subdirectories

Section V:	gives a description of DUTIL and its functions, including the DUTIL command line commands
Section VI:	describes encryption and how to use it
Appendix A:	provides a listing of messages from INSTALL, DUTIL, IDEA, and IBM
Appendix B:	describes the proper care of removable cartridges
Appendix C:	list of IDEA products
Appendix D:	glossary of terms
Appendix E:	customer support information

An index is provided.

Section II:

Hardware Installation

Overview

The following is a list of steps required for installation:

- Filling out the Warranty Card
- Opening the IBM PC
- Checking card jumpers
- Inserting the controller card
- Connecting the drive to the IBM
- Replacing the IBM cover
- Running INSTALL

Tool Requirements

- A medium size flat blade screwdriver is required to open the IBM and to remove a slot cover.
- Pliers or a 1/4 socket wrench may be needed to remove the back cover of some models of the IBM PC.

Getting Started

When you open your Diskit 2 Plus package, the first thing you notice will be the amount of packing material used to ensure that you receive it undamaged. Please save your box and inside packaging material. If you need to return the card for repair, this packaging will provide the safest shipping container.

Careful!

During the installation process, please be careful with the IDEA controller card. Dropping the card and similar accidents may result in improper operation.

Serial Numbers

Please turn your IDEA controller card to the circuit side. You will find the serial number along the top edge. Record this number NOW on both your warranty card and on the following line in this manual.

Serial Number

Please write the version number on your software diskette here:

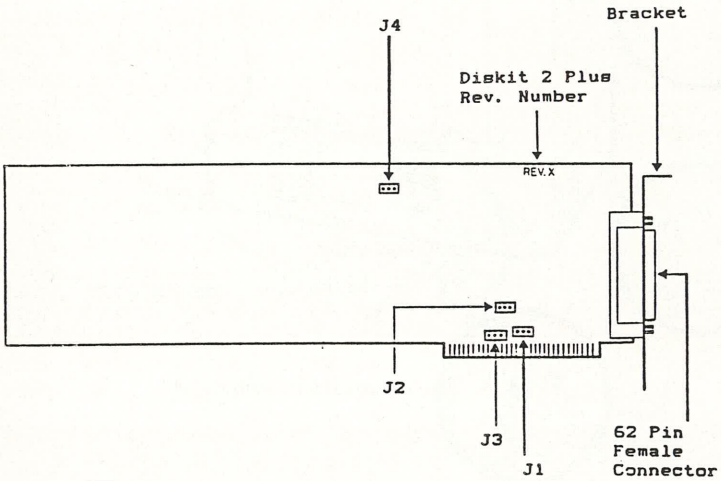


Figure 2-1: IDEA Controller Card

Opening the IBM

1. Turn off the IBM power switch.

2. Turn off power to any peripheral devices (printer, monitor, hard disk, etc.)

3. If you have an AT, unlock it.

4. Unplug the computer and all peripherals from the wall outlet.

5. Carefully note where each cable is attached. Disconnect all cables from the back of the IBM.

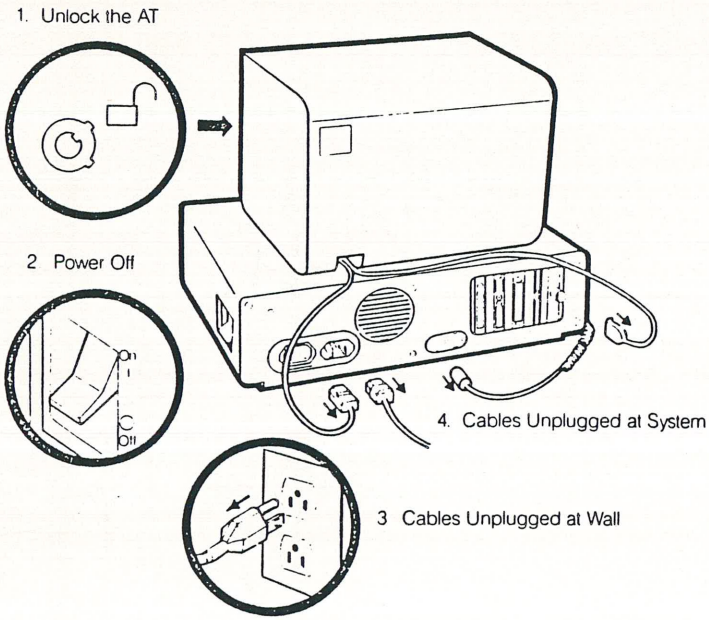


Figure 2-2: Disconnecting the Cables

Cover Removal:

1. Move your keyboard and all peripheral equipment away from the work area.

2. Position the IBM to allow rear access.

3. With an AT, you must remove the back panel first. Pull firmly to detach the plastic fasteners.

4. The cover is attached by two or five screws. With a flat blade screwdriver, remove the cover mounting screws by turning the screwdriver counterclockwise, as shown below.

   Certain models may require the use of pliers or a 1/4 inch socket wrench.

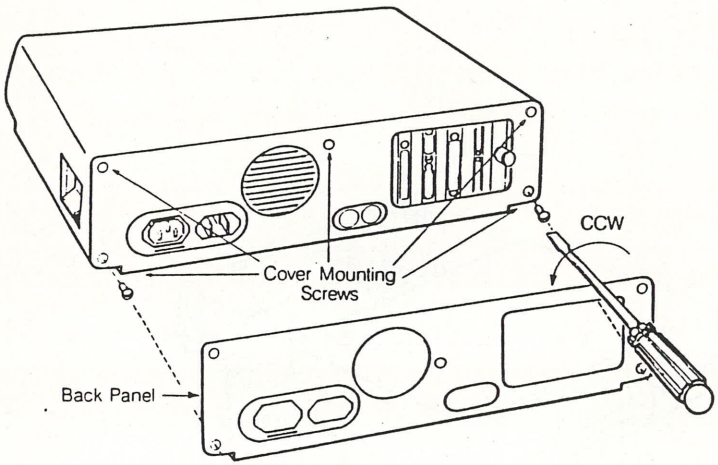


Figure 2-3: Removing the Mounting Screws

Carefully slide the cover away from the rear of the unit. When the cover will go no further, tilt it up and remove it from the base. The AT requires no tilting.

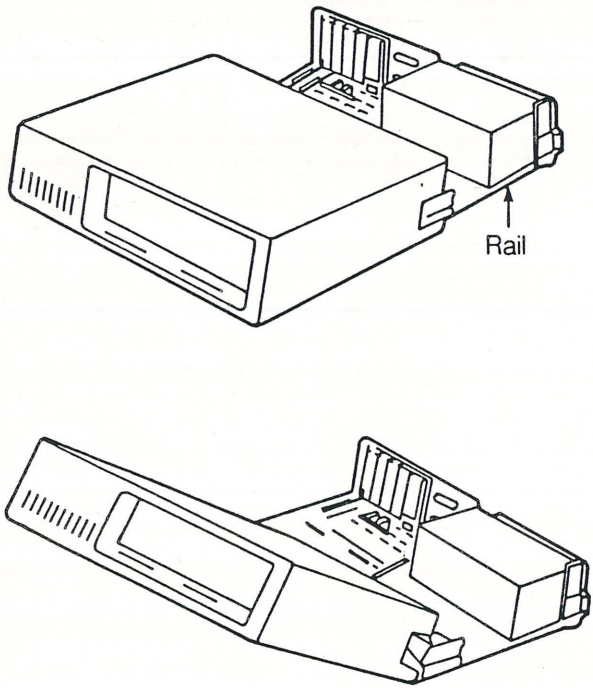


Figure 2-4: Removing the Cover

Checking Jumper J1 and J4 Settings

Jumper J1 Settings (Primary/Secondary Address)

Locate jumper J1 on your IDEA Diskit 2 Plus card (refer to Figure 2-1). There are two possible settings for jumper J1. The setting you choose depends on whether Diskit 2 Plus is the only hard drive.

When the IDEA Diskit 2 Plus is the only hard drive, make sure that the jumper cap is placed on the two right-hand pins, thus choosing the primary address. Refer to Figure 2-5.

Note that if you remove the jumper cap from jumper J1, the jumper will act as if you chose the two right-hand pins.

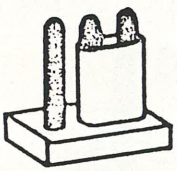


Figure 2-5: Primary Address (Jumper J1)

When you already have an internal hard disk and add the IDEA Diskit 2 Plus, make sure that the jumper cap is placed on the two left-hand pins, thus choosing the secondary address. Refer to Figure 2-6.

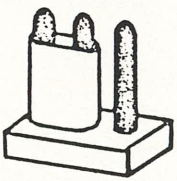


Figure 2-6: Secondary Address (Jumper J1)

Jumper J-4 Settings (Encryption/No Encryption)

Locate jumper J-4 on your IDEA Diskit 2 Plus card (refer to Figure 2-1). There are two possible settings for jumper J4. The setting you choose depends on whether you wish to have the option of enabling encryption each time you boot. Refer to Section 6 for detailed information on encryption.

If you plan to use encryption, place the jumper cap on the left-hand pins. Refer to Figure 2-7. Note that doing this does not enable encryption. You must also fill in the Encryption Menu (refer to Section 6).

Figure 2-7: Jumper Cap on Left-hand Pins (Encryption Possible)

If you never plan to use encryption, place the jumper cap on the right-hand pins. Refer to Figure 2-8. If you do this, you will not have the option of enabling encryption when you boot the system.

Note that if the jumper cap is removed from jumper J4, the jumper acts as if the cap was placed on the right-hand pins.

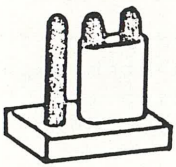


Figure 2-8: Jumper Cap on Right-hand Pins (Encryption NOT Possible)

Jumpers J2 and J3

Do not touch jumpers J2 and J3. Under normal conditions these jumpers are not used.

Jumper J2 enables or disables BIOS RAM. When the jumper cap covers the right-hand jumpers or the jumper cap is removed, BIOS RAM is enabled. When the jumper cap is placed on the left-hand pins, BIOS RAM is disabled.

Jumper J3 concerns hardware interrupts. When the jumper cap covers the right-hand pins, hardware interrupt 2 (IRQ2) is selected. When the jumper cap covers the left-hand pins, hardware interrupt 5 (IRQ5) is selected.

Inserting the IDEA Controller Card

Slot Cover Removal: There are five to eight expansion slots towards the rear of the IBM. Choose any empty slot.

Use a flat blade screwdriver to remove the screw that holds the system expansion slot cover in place by turning it counterclockwise (marked CCW on the figure below).

NOTE

Save the screw for alignment of the card.

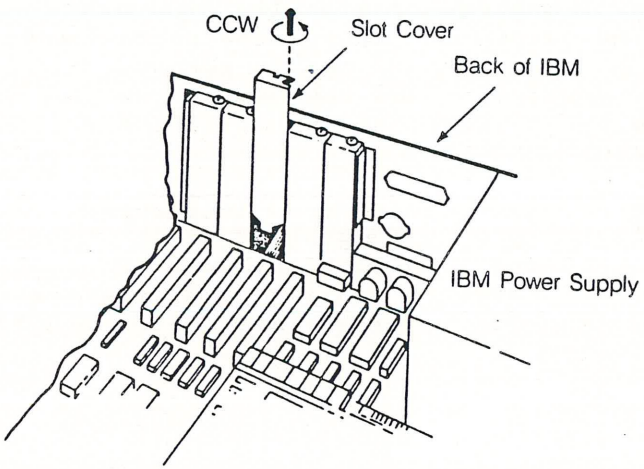


Figure 2-9: Removing the Slot Cover

Controller Card Insertion: Hold the IDEA controller card by the two corners. Slide it down and firmly press it into the expansion slot.

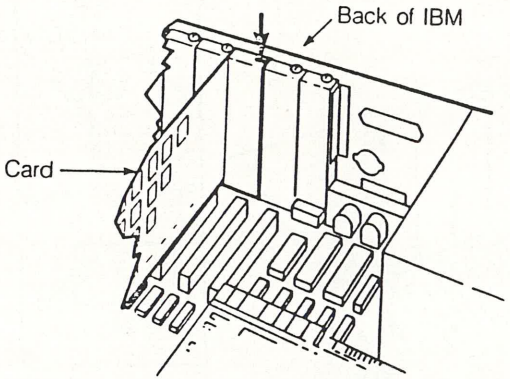


Figure 2-10: Inserting the Controller Card

Aligning the Controller Card: Align the hole in the card's retaining bracket with the hole in the rear panel of the computer. Turn the screw clockwise (CW).

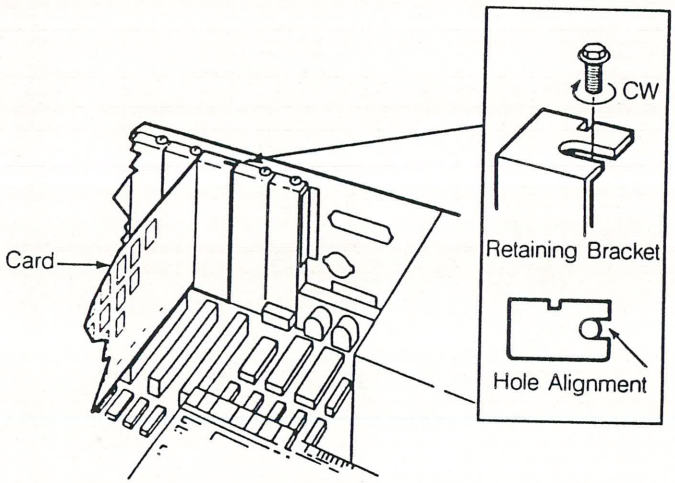


Figure 2-11: Aligning the Card

Replacing the IBM Cover

If you have any other options to install, do so now, before replacing the cover.

Replace the cover by positioning it as shown, and carefully sliding it toward the rear of the computer. The AT requires no tilting.

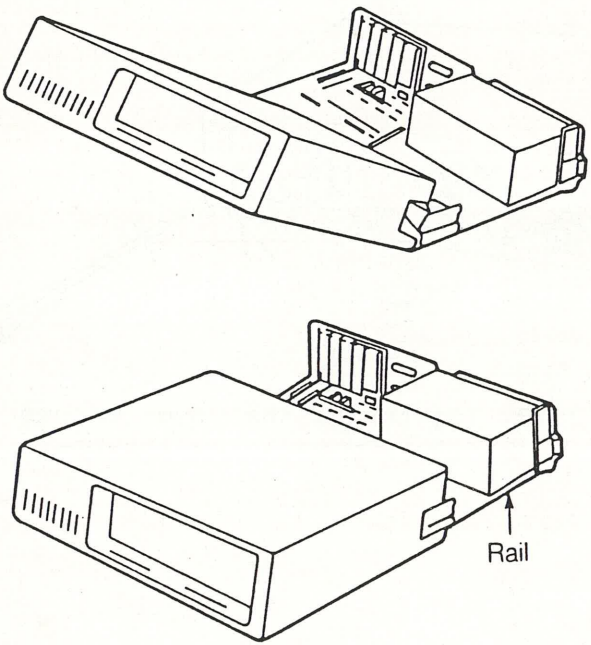


Figure 2-12: Replacing the Cover

Replacing the Cover Screws: When the cover is all the way to the rear, align the screws with the threaded tabs. To tighten the screws, use a flat blade screwdriver and turn them clockwise.

If you have an AT, replace the back panel by pressing it into the plastic fasteners. Relock the AT if this seems desirable.

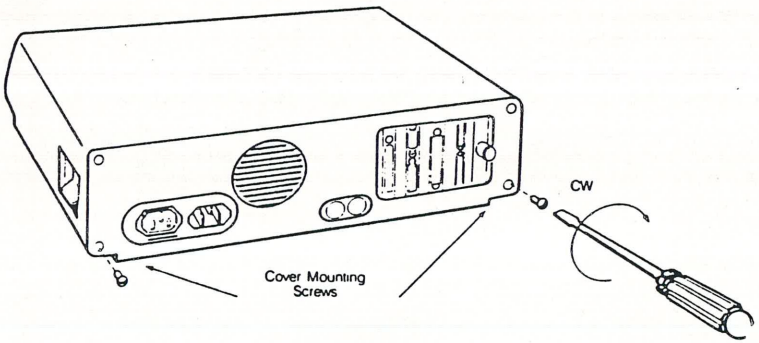


Figure 2-13: Tightening the Cover Screws

Connecting the Drive to the IBM

Examine the IDEA cable. Either end may connect to the card in the IBM slot, or to the connector on the Diskit 2 Plus drive.

Each end of the cable has a connector made so that it only connects one way. Attach one end to the connector on the back of the Diskit 2 Plus drive. Attach the other end to the connector on the IDEA controller card that is visible in the IBM slot.

Most customer problems can be traced to loose or incorrect cabling. Be sure that the connectors are firmly attached. Use the screws that come with the IDEA cable to secure it both to the drive and to the IBM.

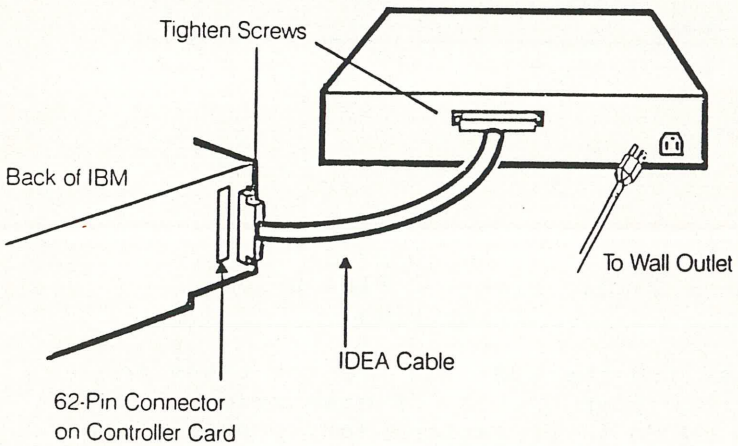


Figure 2-14: Attaching the Drive to the IBM

Make sure that your Diskit 2 Plus drive electrical outlet cord has been plugged into a suitable AC outlet.

Push the button on the front of the case to turn the power ON. Notice that the indicator light (next to the ON/OFF button) lights when the power is ON. Press the ON/OFF button a second time to turn the power OFF.

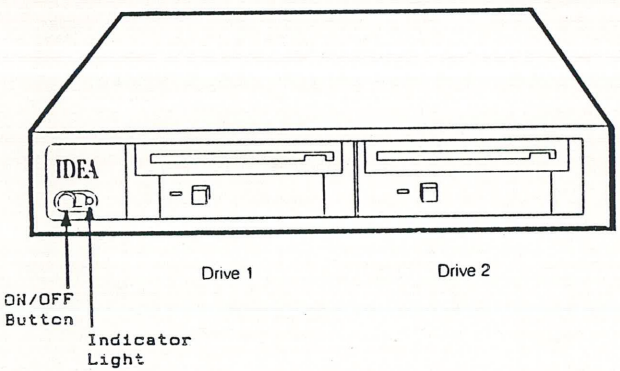


Figure 2-15: Diskit 2 Plus Drive (Front View)

Recabling the IBM: You are now ready to recable your system. Please refer to the IBM Guide to Operations for recabling the keyboard, monitor, printer, and other peripherals.

Running INSTALL

As soon as Diskit 2 Plus is installed and you have made a copy of the IDEA software, check installation with INSTALL, as described in the next section.

Section III:

Running INSTALL

INSTALL is the only program you need to get started with Diskit 2 Plus. Note that if you have set the Diskit 2 Plus jumper to encryption, you must fill in the Encryption Menu before running INSTALL (refer to Section 6). INSTALL is an easy and flexible program for identification, diagnostics, and help. It can determine whether you already have hard disks installed, whether your controller board is set for the number of drives you have, and whether the jumper setting matches your choice of enabling or disabling encryption. The program also checks cabling, drives, and cartridges in the Diskit 2 Plus system. It configures your CONFIG.SYS file automatically to include the driver that controls the cartridges if you are using a secondary address. If you are using a primary address, INSTALL configures the AUTOEXEC.BAT file automatically to include the driver that controls the cartridges. It allows you to choose which, if any, of your drives is to be bootable. INSTALL also checks to be sure that your choice to enable or not enable encryption matches the J4 jumper setting.

Use this program when you first install Diskit 2 Plus to test the card, drive, cabling, and cartridges. You can continue to use INSTALL when you have new, unformatted cartridges to add to your system or when a cartridge that has been used behaves unpredictably. For more technical levels of diagnostics and repair, you can also use DUTIL.

Install is designed for use with Diskit 2 Plus and any combination of disk controller boards that are compatible with IBM. Other IDEA controller boards in the system should be on version 4.0 or higher of IDEAdisk software. You will not hurt your system if you use INSTALL with other combinations. If, in these cases, you have difficulties, call IDEA Technical Support. In particular, if you have an IDEAdisk with software at a revision below 4.0, IDEA recommends you call your dealer for an upgrade.

The Diagnostic and Boot Sequence

1. Before you use INSTALL, make a backup copy of the software. To do this, you need your DOS diskette, a blank formatted diskette, and the IDEA diskette. Follow the instructions in your DOS manual for the COPY command for the number of diskette drives you have. For information on formatting blank diskettes, refer to your DOS manual also.

   You now have two copies of the IDEA software. Put the original away for safekeeping and label the copy clearly.

2. To run the program, at the DOS prompt enter:

   A> INSTALL <CR>

   On the screen, you see a quick succession of completion messages and then the choice of bootable drive:

screen 1-A

```
==========================================================================
          IDEAssociates Diskit2+ INSTALL Program Rev. x.xx
                      Copyright (C) 1986

              Previous disk controller - OK
              (or, no previous disk controller - OK)

   Controller - OK
   Cabling - OK
   Drive 1 - OK
   Drive 2 - OK
   Drive 1 - Cartridge is readable by DOS
   Drive 2 - Cartridge is readable by DOS
   Diagnostics Complete
==========================================================================
   Do you want to enable encryption

   Ctrl-C to return to DOS
==========================================================================
```

3. You are prompted to enter whether you want to use encryption.

4. What you choose at this point depends on whether you already had a hard disk installed before adding Diskit 2 Plus. If Diskit 2 Plus is your first hard disk, go to step 4A. If you had at least one existing hard disk, go to step 4B.

4A. If Diskit 2 Plus is your first hard disk, you may choose to make it bootable. This means that the system will boot from Drive 1 of Diskit 2 Plus rather than from a diskette in Drive A. If you will use the hard disk more than diskettes, IDEA recommends that you make this disk bootable.

To make Drive 1 bootable, have both a DOS diskette (one you can boot from) and the IDEA diskette ready, then answer Y to the question, "Make Drive C bootable?" INSTALL asks for the DOS diskette with system files and then for the IDEA diskette.

If you choose not to make Drive 1 bootable, answer N to the question, "Make Drive C bootable."

4B. If you already have one or more hard drives, you have two choices:

- o Boot from the first existing hard drive (Drive C).
- o Continue booting from a diskette in Drive A.

Be sure you have both your usual DOS boot diskette and the IDEA diskette handy. Then choose to boot from existing Drive C by pressing F1, or from Drive A by pressing F2.

4. Your Diskit 2 Plus is ready to use. See Section 4 for tips on getting the most out of a hard disk.

5. If you made one hard drive bootable, from now on you should boot your system with the door to Drive A open so that DOS looks for the system files on the new drive.

Note

The bootable drive will be named C.

If you have more than two drives, each time you reboot, you will get this screen:

```
=====================================================================
Diskit2+ Device Driver, version x.xx
Copyright (C) 1986, IDEAssociates, Inc.

Drive 1 IDEAdisk Type xx Recalibrating .. Drive Recalibrated.
Drive 1 IDEAdisk Type xx Loading ... Drive Loaded.
Drive 2 IDEAdisk Type xx Recalibrating ... Drive Recalibrated.
Drive 2 IDEAdisk Type xx Loading ... Drive Loaded
x logical disks allocated
=====================================================================
```

The number of logical disks (drives) allocated depends on whether one of them is bootable. The bootable disk does not count itself.

Reference Material and Diagnostic Help

The rest of this section contains a chart of all procedures done by INSTALL and a list of all possible messages for the various situations that may occur. If your system performs normally when INSTALL is run, you do not need this material.

If you see an error message, go to the appropriate step of this section:

Controller Check	step 1
Cable Check	step 2
Drive Check	step 3
Cartridge Check	step 4
Encryption Check	step 5
Unable to make a drive bootable	step 6

Chart of INSTALL Operation

Here is the sequence of checks that INSTALL makes when invoked. In most instances, the user has no part to play until step 5, when the user is prompted to enter whether or not he plans to use encryption.

1. Controller Check
   - 1A, 1B Other controllers present? JP1 jumper setting correct?
   - 1C Product #, version #, date match?
   - 1D Diskit 2 Plus controller present?
   - 1E Controller diagnostics successful?

2. Cable Check

3. Drive Check
   - 3A Not found?
   - 3B No cartridge?
   - 3C Write protected?
   - 3D Other problem?

   3E Go on if only one drive is OK?

   Yes

4. Format Check
   4A Is cartridge readable by DOS?
   4B If not, try to make readable.
   4C If not successful, do a hard format.

      If successful, make cartridge readable and tell user to reboot.

5. Encryption
   This provides a double check to be sure that you have chosen encryption or have disabled encryption by placing your jumper cap on J4 of the IDEA Diskit 2 Plus card correctly.

   You are prompted to determine whether or not you wish to use encryption.

   5A When you answer this question, the jumper cap position on J4 is checked to be sure that it corresponds to your answer.

   5B If the jumper is set correctly, a message is displayed which indicates that the jumper is okay and you can continue with the INSTALL program.

   5C If the jumper is not set correctly, you are prompted with a display of the correct setting and you are not allowed to continue with the INSTALL program until the jumpers are set correctly.

6. Offer to Make a Drive Bootable

6A. With an existing hard drive

Does user want to make Drive C bootable
or add IDEA driver to Drive A diskette?

6B. Drive C

System files already present?
Is there room for system files?
Is the disk write protected?
Are the system files on Drive A?

Copy system files
Copy IDEA driver
Make bootable if it is not already.

End

6C. Drive A

Is diskette in A bootable?
Copy IDEA files to A.

End

6D. No existing hard drive

Are both drives good?

No — Yes

End — Does user want to boot Drive 1?

No — Yes

Put PRIMARY.COM (driver) on drive A.

Put PRIMARY.COM (driver) on drive C.
Is there room for system files?
Is Drive 1 write protected?
Where are the system files?
Copy system files and make Drive 1 bootable. (This is now Drive C.)

End

1. Controller Check

INSTALL first checks that jumper settings on the IDEA controller card match the number of controllers inside the IBM. Then it checks that the software on the diskette matches the version of the IDEA controller card. If everything is consistent, INSTALL proceeds to step 2. Otherwise, it displays one of the following screens.

1A. No Other Controllers Present: If the jumper is set to a Secondary Address but there is no other identifiable controller card, the lower half of the screen displays:

```
                                                              screen 1-B
================================================================================
Please:  Turn off your system, remove the controller, and set
         jumper J1 for the Primary Address.

================================================================================
```

The program returns to DOS.

TIP

If the preceding screen appears, but you know you have a previous IDEA controller, check the version of IDEA software on the other controller. All software should be at revision 4.0 or higher.

1B. Other Controller Present: If the jumper (J1) is set to Primary Address but there is another controller card installed, the lower half of the screen displays:

```
                                                              screen 1-C
================================================================================
Please:  Turn off your system, remove the controller, and set
         jumper J1 to the Secondary Address

   Ctrl-C  Return to DOS          Esc to return to previous menu
================================================================================
```

The system returns to DOS.

1C. Product Number, Version Number, Date: INSTALL checks product number, version number, and date. If the software and the hardware have the same numbers, INSTALL continues with step 2. If not, it displays:

screen 1-D

```
==========================================================================
   This program is incompatible with the hardware.
   Version x, product n, or mm/dd/yy is a mismatch.
   Please be sure you are using the correct version of the
        IDEA software diskette.  If necessary, change the
        diskette and retry.

   If this is the second time you have received this message,
   contact your dealer for an upgrade of software or hardware.
   Retry (Y/N)?

  Ctrl-C to return to DOS
==========================================================================
```

Note that Y and N are accepted with no carriage return.

TIP

The files D2PLUS.SYS and PRIMARY.COM must be on the IDEA diskette in Drive A when INSTALL is started. If screen 1-D appears, check for these files first.

1D. Diskit 2 Plus Controller: If no controller card is found, INSTALL displays this screen:

screen 1-E

```
Do you have an IDEA controller installed (Y/N)?

  Ctrl-C to return to DOS
```

If the answer to screen 1-E was N, INSTALL displays:

```
  This program only works with IDEA products.
  Install the IDEA external controller and retry.
```

The program returns to DOS.

If the answer to this question is Y but no recognizable IDEA controller is found, the screen shows:

screen 1-F

```
          Still cannot match drive configuration.
   Do you have another adapter/controller card installed (Y/N)?

  Ctrl-C to return to DOS
```

If the answer is still No and INSTALL still cannot identify another controller, it displays:

```
                                                                screen 1-G
================================================================================
    Turn off your system.
    Remove the IDEA external controller card.
    Check that the jumpers are set on the IDEA controller card
          as described in the documentation.
    (Or press F1 now for a help screen on jumpers.)
    Reinsert the IDEA controller, reboot, and invoke INSTALL.

    If this is the second time you have made this check, call your
          dealer.

  Ctrl-C  to return to DOS              F1 for help on system jumpers
================================================================================
```

Pressing F1 on screen 1-G calls up this screen:

```
                                                                screen 1-H
================================================================================
       IDEA CONTROLLER CARD JUMPERS FOR ONE CONTROLLER INSTALLED

         Place jumper cap on the two left-hand pins of J1

  Ctrl-C to return to DOS                 Esc to return to previous menu
================================================================================
```

If the answer to screen 1-F was Y, the following screen appears:

```
                                                                screen 1-I
================================================================================
    The two adapter/controller cards may accidentally have the same
    address.
    Please:
          Turn off your system and remove both adapter/controllers.
          Be sure the IDEA controller card for the external drives
          has the jumper settings prescribed in the documentation.
              (Press F1 now for a help screen).
              Reinsert the IDEA controller only, reboot, and invoke
              INSTALL.
    If this is the second time you have made this check, call your
          dealer.

    Ctrl-C to return to DOS          F1 for help on system jumpers
================================================================================
```

Pressing F1 on screen 1-I leads to the following screen:

```
                                                                screen 1-J
================================================================================
      IDEA CONTROLLER CARD JUMPERS FOR TWO CONTROLLERS INSTALLED

       Place the jumper cap on the two right-hand pins of J1.

   Ctrl-C to return to DOS              Esc to return to previous menu
================================================================================
```

1E. Controller Diagnostics Failure: If the self diagnostics on the controller board fail, the lower half of the screen displays:

screen 1-K

```
Controller failed diagnostics
       Turn off your system.
       Check all cable attachments.
       Reinsert the card firmly.
       Reboot the system and invoke INSTALL.

If this is the second time you have made this check, call your
dealer.

Ctrl-C to return to DOS
```

2. Cable Check

INSTALL quickly checks the cable connections. If they are good, the screen displays the following message and goes on to step 3.

screen 2-A

```
                IDEAssociates Diskit2+ INSTALL Program Rev. x.xx
                      Copyright (C) 1986

          [no] previous disk controller - OK

   Controller - OK
   Cabling - OK

   Ctrl-C to return to DOS
```

If the cabling does not appear good, INSTALL displays:

screen 2-B

```
================================================================================
            IDEAssociates Diskit2+ INSTALL Program Rev. x.xx
                        Copyright (C) 1986

             [no] previous disk controller - OK

   Controller - OK
================================================================================
   Cable check not satisfactory. Cannot detect cable or drives
   at end of cable.
   Please:
      Check that cabling is done as
      described in the documentation.
      Check that cables and board are pushed in tightly.
   If necessary, turn off system, recable, reboot, and invoke
        INSTALL.

   If this is the second time you have made this check,
   call your dealer.

                       Retry (Y/N)?

   Ctrl-C to return to DOS
================================================================================
```

3. Drive Check

If both drives respond normally, INSTALL displays the following message and goes on to step 4.

screen 3-A

```
IDEAssociates Diskit2+ INSTALL Program Rev. x.xx
                    Copyright (C) 1986

          [no] previous disk controller - OK
   Controller - OK
   Cabling - OK
   Drive 1 - OK
   Drive 2 - OK

   Ctrl-C to return to DOS
```

In checking, INSTALL follows steps 3A through 3D once through for each drive.

3A. Drive not found: If INSTALL receives a signal of drive not found, it displays in the lower half of the screen:

screen 3-B

```
    Drive <X> is found not ready.

    Please reinsert the cartridge. If this is the second message,
    insert a different cartridge.  Be sure door is firmly closed.
    After that, call your dealer.

                        Retry (Y/N)?

   Ctrl-C to return to DOS
```

An answer of N allows you to continue with the next
step, which will be either a check of the next drive
or a format check of the cartridge in the previous drive.

3B. No power: If the cartridge is not powered on or there is no cartridge in the drive, INSTALL displays:

screen 3-C

```
IDEAssociates Diskit2+ INSTALL Program Rev. x.xx
                Copyright (C) 1986

   Jumper settings indicate [no] previous disk controller - OK
   Controller - OK
   Cabling - OK
==========================================================================
   Drive <X> not responding.

   Please be sure a good cartridge is firmly seated in drive,
   with door firmly closed. Also check to make sure power is on.
   If this is the second message, try a different cartridge.
        Retry (Y/N)?


   Ctrl-C to return to DOS
==========================================================================
```

3C. Write protected: If the cartridge is write protected, you see on the lower half of the screen:

screen 3-D

```
Cartridge is write protected.

Please change write-protect tab or insert a
different cartridge.

          Retry (Y/N)?


Ctrl-C to return to DOS
```

Information on changing the write-protect tab is located in Appendix B.

An answer of N leads to screen 3-F if this is the second drive.

3D. Drive Found Not Ready: Several factors may cause the following screen. Check power to the drive, the cable, and be sure the drive door is firmly closed and the drive light is unflashing green.

screen 3-E

```
Drive <X> is found not ready.

Please reinsert the cartridge.  If this is the second message,
insert a different cartridge.  Be sure door is firmly
closed and that power is on.  After that, call your dealer.

Retry (Y/N)?


Ctrl-C to return to DOS
```

An answer of N leads to screen 3-F.

3E. If one drive does not pass: If one drive passed diagnostics but the other did not, you see:

screen 3-F

```
IDEAssociates Diskit2+ INSTALL Program Rev. x.xx
                Copyright (C) 1986

          [no] previous disk controller - OK
   Controller - OK
   Cabling - OK
   Drive x - Not OK
   Drive y - OK
Drive <x> passes all tests, but drive <y> does not. Do you
wish to continue testing the cartridge in drive <x> only
(Y/N)?

Ctrl-C to return to DOS
```

The answer N returns you to DOS. The answer Y leads to step 4.

4. Format Check

This is a check for a format readable by DOS (referred to technically as a DOS partition). It is done once for each working drive. If the cartridges respond normally, the screen displays the following message and goes on to step 5.

NOTE

If the cartridge does not match the encryption option and key currently in use, its format is not readable. You must change cartridges, enable or disable encryption, change the encryption key on the encrypted cartridge, or reformat the cartridge, thereby losing all data presently on it. Refer to Section 6.

screen 4-A

```
IDEAssociates Diskit2+ INSTALL Program Rev. x.xx
Copyright (C) 1986

[no] previous disk controller - OK
Controller - OK
Cabling - OK
Drive 1 - OK (or not OK)
Drive 2 - OK (or not OK)
Drive 1 - Cartridge is readable by DOS.
Drive 2 - Cartridge is readable by DOS.

Ctrl-C to return to DOS
```

4A. Unreadable Format: If the problem is an unreadable DOS format, the screen displays:

screen 4-B

```
Cartridge <X> is not readable.  Do you want to:

F1.  Format the cartridge for DOS (thus losing all data on
     cartridge).
F2.  Insert a different cartridge (do so before pressing F2).
F3.  Exit INSTALL.

Ctrl-C to return to DOS
```

4B Make Readable by DOS: If the answer to the preceding screen is F1, INSTALL displays:

```
                                                                screen 4-C
================================================================================
   Formatting cartridge for DOS ... Please wait ...

   Ctrl-C to return to DOS
================================================================================
```

The format takes about 10 minutes for a 10MB cartridge. At the end of the format, the same screen adds:

```
                                                                screen 4-D
================================================================================
   Format Complete ... XX bad sectors found.

                    Strike any key to continue ...

Since the information needed by DOS has been modified,
the system must be rebooted before the drive
may be accessed through DOS.
   Place a DOS boot diskette in Drive A and
   strike any key to reboot, and then invoke INSTALL again.
================================================================================
```

Press any key and wait for the IBM to reboot, then enter INSTALL, which will take you to Step 5 or to a format of the other drive.

If the answer to screen 4-B was F1 and INSTALL is unable to format the cartridge for DOS, it displays:

screen 4-E

```
Failure to format the cartridge for DOS.  Do you want to hard format
the disk (Y/N)?

If this is the second time you have received this message,
please call your dealer.

Ctrl-C to return to DOS
```

An answer of N returns you to DOS.

TIP

If you get the message above, check that the cartridge is firmly seated in the drive and that it's encryption option matches that of the drive.

4C. Hard format: If you answer Y to screen 4-E, INSTALL performs a hard format on the drive. This operation takes three to five minutes. The screen above adds the message:

```
Formatting Drive ... Please Wait
```

If the format is successful, INSTALL then formats the cartridge for DOS and returns to screen 4-D.

If the hard format is not successful, INSTALL displays appropriate messages such as:

screen 4-F

```
Drive unit unusable - system area has defect.
        Strike any key to continue ...
```

INSTALL returns to screen 4-B. Insert a new cartridge and retry.

5. Checking Encryption

The screen prompts you to enter whether or not encryption is desired. The system then checks the jumper setting to be sure it coincides with your choice. If it does not match, you are asked to check your jumper setting. If it does match, the next screen shown is making the drive bootable (see step 6 below).

6. Making a Drive Bootable or Modifying the Current Bootable Drive

A bootable drive is one from which you can start the IBM when you power it on. Drive A is always bootable if it has a DOS diskette in it. It is often more convenient, however, to start from the hard drive.

IDEA recommends that, if Diskit 2 Plus is your only hard drive, you make it bootable. If you already have a hard drive, continue booting as you did previously, either from the previous hard drive or from the diskette in Drive A. If you decide later that it is more convenient to boot from the previous hard drive, you can rerun INSTALL.

With No Existing Hard Drive: If you chose to make Diskit 2 Plus bootable, Drive 1 is automatically renamed Drive C. To make Drive 1 bootable, INSTALL requires access to system files on a boot DOS diskette and room at the beginning of Drive 1 to put three files. It also requires access to the IDEA diskette to copy the file PRIMARY.COM to Drive C. It also creates an AUTOEXEC.BAT file on Drive C to load the file at startup. This means that Drive 1 should have no data on it. Drive 1 must not be write protected.

If you choose to continue booting from Drive A, INSTALL copies PRIMARY.COM from the IDEA diskette to your boot diskette and inserts that file in the AUTOEXEC.BAT file on the boot diskette.

With an Existing Hard Drive: If you have one or more previous hard drives, INSTALL must go through more steps to make the new drives known to the old ones. INSTALL makes or modifies the CONFIG.SYS file on a previous drive to include D2PLUS.SYS, the IDEA driver, so DOS will know to look for the driver at startup.

The first existing hard drive should be Drive C. If you want to boot from C, even if the drive is already bootable, INSTALL must modify the CONFIG.SYS file on that drive and copy D2PLUS.SYS to it. INSTALL requires access to system files in Drive A and access to the IDEA software, also in Drive A. The hard disk should have room for at least two more files. If it was not already bootable, it must have room at the beginning for three additional files.

If you choose Drive A and you have an existing hard drive, you should have ready a DOS boot diskette and the IDEA software diskette. INSTALL adds or modifies the CONFIG.SYS file and copies the D2PLUS.SYS file to that diskette.

6A. With an Existing Hard Drive: If you have another controller card with a hard disk, the lower half of the screen is:

screen 6-A

```
You may make drive C bootable.
This means that, when your system is powered on and there is
no diskette in drive A, the system will start from drive C.

Or, you can just leave A as the only bootable drive, but you
should make a bootable disk that includes the  IDEA driver
for the new disks.  Choose one:

F1 - Make Drive C bootable   F2 - Copy IDEA driver to boot diskette

Ctrl-C to return to DOS
```

If you select F2, go to screen 6-G.

6B Making Existing Drive C Bootable: If you select F1, when the disk is bootable, you see in the lower half of the screen:

screen 6-B

```
Copying IBMBIO, IBMDOS, and COMMAND.COM to C.
Modifying (or creating) CONFIG.SYS on drive C ...
Copying IDEA driver to Drive C ...

IDEA driver installed on drive C.
Enjoy your IDEA product!
```

The program returns you to DOS.

If Drive C was already bootable, the lower half of the screen is:

screen 6-C

```
Modifying CONFIG.SYS file on drive C ...
Copying IDEA driver to drive C ...

IDEA driver installed on drive C.


Enjoy your IDEA product!
```

The program returns you to DOS.

If the answer to screen 6-A was F1 but Drive C already has system files, you see this message:

screen 6-D

```
Modifying CONFIG.SYS file on drive C ...
Copying IDEA driver to drive C ...

Drive C already has a DOS system on it.


Ctrl-C to return to DOS
```

The program returns you to DOS.

If the disk is write-protected, INSTALL displays:

screen 6-E

```
Drive 1 is write-protected.
Please change write-protect tab or insert a
different cartridge.

                    Retry (Y/N?)

Ctrl-C to return to DOS
```

Information on changing the write-protect tab is located in Appendix B.

If INSTALL cannot find the unlisted system files, it displays:

screen 6-F

```
Can't find DOS system files on diskette in drive A.
Please insert a DOS boot diskette in drive A and
strike any key.

Ctrl-C to return to DOS
```

6C. Putting IDEA software on the boot diskette: If the answer to screen 6-A was F2, INSTALL displays:

```
                                                                screen 6-G
================================================================================
                IDEAssociates Diskit2+ INSTALL Program Rev. x.xx
                        Copyright (C) 1986

                [no] previous disk controller - OK
   Controller - OK
   Cabling - OK
   Drive 1 - OK
   Drive 2 - OK (or not OK)
   Drive 1 - Cartridge is readable by DOS
   Drive 2 - Cartridge is readable by DOS
   Diagnostics Complete
================================================================================
   Can't find DOS diskette in drive A.
   Please insert a DOS boot diskette into drive A and
   strike any key when ready ...(This message only appears
   if drive A does not have DOS system files.)

   Put the IDEA diskette with D2PLUS.SYS on it in drive A.
   Strike any key when ready... (This message appears only
   if the IDEA diskette has been removed from Drive A.)

   Modifying <or creating> CONFIG.SYS file on drive A ...
   Copying IDEA driver to drive A ...

   IDEA driver installed on drive A.
   Enjoy your IDEA product!

Ctrl-C to return to DOS
================================================================================
```

The program returns you to DOS.

6D. With No Existing Hard Drive: If you do not have another controller with a previous hard disk, you see this message:

screen 6-H

```
=========================================================================
          IDEAssociates Diskit2+ INSTALL Program Rev. x.xx
                      Copyright (C) 1986

              [no] previous disk controller - OK
   Controller - OK
   Cabling - OK
   Drive 1 - OK
   Drive 2 - OK (or not OK)
   Drive 1 - Cartridge is readable by DOS
   Drive 2 - Cartridge is readable by DOS
   Diagnostics Complete
=========================================================================
   You may make your external cartridge (C) bootable.
   This means that, when your system is powered on and there is
   no diskette in drive A, the system will start from drive C.

   (Of course, you can just leave A as the only bootable drive.)

   Do you want to make Drive C bootable (Y/N)?

   Ctrl-C to return to DOS
=========================================================================
```

If INSTALL is not able to proceed, it displays error messages from screens 6-D or 6-F as needed.

Whether you choose Y or N, the program will make or modify the AUTOEXEC.BAT file to contain an entry to load PRIMARY.COM. If you select N, it will perform this function on drive A; if you choose Y, it will perform this on drive C.

6E Making Drive C Bootable: If the answer to screen 6-H was Y, when the drive is bootable, the lower half of the screen displays:

screen 6-I

```
Copying IBMBIO.COM, IBMDOS.COM, and COMMAND.COM to drive C ...

Drive C is now bootable.  To test it, open the door
to drive A, and reboot with CTRL-ALT-DEL.

Enjoy your IDEA product!
```

The program returns you to DOS.

If the cartridge is write-protected, you get the message:

screen 6-J

```
Drive C is write-protected.

Returning to DOS.

Ctrl-C return to DOS
```

The program returns you to DOS.

If there are already system files on Drive C, INSTALL still copies PRIMARY.COM to Drive C and creates or modifies the file AUTOEXEC.BAT and screen 6-I displays:

```
==========================================================================
Drive C already has a DOS system on it.
Copying IBMBIO.COM, IBMDOS.COM, and COMMAND.COM to drive C ...
etc.
==========================================================================
```

If the answer to screen 6-H was N, the screen displays:

```
==========================================================================
End of INSTALL
Enjoy your IDEA product!
==========================================================================
```

If, however, Drive 1 did not pass all of the drive diagnostics, you see:

```
                                                              screen 6-K
==========================================================================
                IDEAssociates Diskit2+ INSTALL Program Rev. x.xx
                          Copyright (C) 1985

==========================================================================
   You may make your internal hard disk (C) bootable.
   But, since it did not pass ALL of the drive diagnostics, you
   must correct whatever problem exists and rerun INSTALL.


       Returning to DOS
==========================================================================
```

The program returns you to DOS.

Section IV:

Using Diskit 2 Plus

Differences Between Diskettes and Hard Disks

In general, you can use Diskit 2 Plus just as you use diskettes. The main difference you will notice is that you can put more files on Diskit 2 Plus and that access to your data is much faster. Because of the larger size of Diskit 2 Plus, there are some differences in the use of IBM DOS commands, and IDEA has supplied some more convenient software.

Using DOS Commands

With Diskit 2 Plus you can use all DOS commands except some for which IDEA supplies equivalent utilities. Instead of FORMAT, use the F2 option of DUTIL. Instead of FDISK, use the F4 option of DUTIL. In addition, the commands DISKCOPY and DISKCOMP were intended only for diskettes. To compare two disks file by file, use FILECOMP. IDEA commands are provided to allow you to backup to Diskit 2 Plus cartridges with ease. The command used depends upon the type of backup being done. Refer to External/Internal and Image backup in this section.

Backup - General Information

Diskit 2 Plus is especially suited to backup, as its removable cartridges can be stored securely. Separate cartridges can also be used to keep separate applications databases for different users or different jobs.

A good strategy for backup is to maintain three backup cartridges for each drive that you use regularly. For example, if you back up Drive C to Drive E daily, start on Monday with a backup cartridge that you label ACCTS.A. On Tuesday, back up Drive C to another cartridge that you label ACCTS.B. On Wednesday, back up Drive C to a third cartridge, ACCTS.C. Then on Thursday, start over and write the new backup over ACCTS.A.

Store the three cartridges separately in an environment that is not too hot or humid and not near magnetic objects. If you need data from a backup cartridge, first try the latest cartridge. (On Thursday morning, this will be ACCTS.C. On Thursday afternoon, this will be ACCTS.A.) If the latest cartridge lacks data you need, go back to the next most recent. Thus you always have three levels of security for your data.

ICOPY -- Image (Cartridge to Cartridge) Backup and Restore

An image backup is a straight copy from one cartridge to another. The backup cartridge will be identical to the original cartridge. This means that if the information on the original cartridge is encrypted, then the backup cartridge will also be encrypted. If the original cartridge is not encrypted, the backup cartridge will not be encrypted. The state of the drives (both encrypted, one encrypted, none encrypted) does not matter.

To perform an image backup, use the ICOPY command. For example, if the master cartridge is in drive 1 and the blank cartridge is in drive 2, type ICOPY 1 2.

IDEAssociates strongly recommends that you put a write protect tab on your source cartridge before using this command.

IBACKUP and IRESTORE -- External or Internal Disk to Cartridge Backup/Restore

If you have an external or internal disk with information you wish to back up on cartridges, you can use an external/internal disk to cartridge backup. Note that you can back up DOS partitions (drives) only. If your external or internal disk has, for example, three partitions, you must specify which of the three you want to back up. Only one partition at a time can be backed up.

To back up to Diskit 2 Plus cartridges, use the IBACKUP command. To restore information from Diskit 2 Plus cartridges, use the IRESTORE command. For example, to back up information from an external or internal drive labeled c, to a cartridge located in drive d, enter:

```
IBACKUP c:
```

where c is the drive you want to back up.

To restore backed up information enter:

```
IRESTORE c:
```

where c is the drive on which you want the information restored.

By using the IBACKUP and IRESTORE commands, you receive prompts to change cartridges if the information being backed up or restored exceeds the capacity of one cartridge.

Note that the IBACKUP command cannot be used to back up a floppy nor to perform an image backup (cartridge to cartridge).

Cartridges created by IBACKUP are not readable by DOS. To use such a cartridge again from DOS, you must first reformat it, thus losing all data.

The external/internal disk to cartridge backup goes through the following steps and prompts.

1. The Diskit 2 Plus program checks your drives prior to backup to determine whether one or both drives are encrypted. If encryption is found, you are prompted to check the drives to be sure that both are encrypted or to remove encryption from both drives.

2. You are then prompted to insert new cartridges into both drives and press any key to begin backup.

3. The program checks the cartridge in the left drive to be sure that the cartridge has been hard formatted. If it has not, a prompt asks if the user wishes to have the cartridge hard formatted. The options are Yes, Abort, and No. If you respond with Yes, the cartridge is hard formatted. Abort causes the backup to stop. If you choose No, the program assumes that you have changed the cartridge to one that is hard formatted but before continuing, the cartridge is again scanned. When the cartridge is hard formatted, the program continues.

4. The cartridge is now checked to determine if it was formatted for DOS. If it has been formatted, a prompt is displayed that reminds you that all information on the cartridge will be destroyed if you continue. The options are Abort, Retry, Continue. Abort stops the backup. Retry assumes that you have changed the cartridge, and the program returns to step 3. If you choose continue, backup begins.

5. The program begins writing to the cartridge in the left drive. Once that cartridge is filled, the program tests the cartridge in the right drive to see that it is hard formatted, etc. The user is prompted to put a new cartridge in the left drive.

6. If you do not place a new cartridge in the left drive, when the cartridge in the right drive is filled, the program will not write over the cartridge filled during this backup session. Each cartridge in a backup session is automatically given a header that provides the program with the time and date. The program checks the header and is prevented from accidentally overwriting.

Creating Subdirectories

Since the hard drive is larger than the diskette, you may find it convenient to create several subdirectories within the drive. This enables you to keep the directory small and to put related files within the same directory. Some DOS commands that are useful with subdirectories are:

MD xy	Create a subdirectory xy within the directory or subdirectory where you are.

CD pathname Change directories: move to the directory defined by pathname. A full pathname is of the form

\sub1\file

where the first backslash (\) means that sub1 is a subdirectory of the main directory, and file is the name of a file within sub1.

RD Remove (delete) a directory. Note that all data must first be deleted from the directory.

All DOS commands for working with subdirectories can be used with Diskit 2 Plus.

Sharing a Disk

If you have IDEAnet or IDEAshare, you can share one or both of your Diskit 2 Plus drives with other users. Diskit 2 Plus also works with many other networking products. You can also share one drive while protecting the other from access through the network.

If you use IDEAnet, IDEAshare, or any other network, plan beforehand which files you want to make accessible to other users and which files you want to protect. It is usually best to put all files for shared access on one drive and all files for restricted use on another.

The documentation for IDEAnet and IDEAshare gives complete instructions for setting up a network for sharing disks and printers.

INSTALL

You can use INSTALL at any time to test your hardware, prepare a new cartridge, or make a new cartridge bootable.

DUTIL

Your Diskit 2 Plus software includes DUTIL, which is described in the following section. It is a more powerful utility that allows you to create more than one partition on a drive and to perform several levels of testing and repair on the cartridge. You may want to use DUTIL instead of INSTALL if you have more than one operating system and want to use different parts of a disk for the different systems. DUTIL is also more convenient if you often prepare new cartridges for use, because you can set up a batch file with all the commands necessary for testing, formatting, partitioning, and making a new cartridge bootable, and run them on one or several cartridges with one command. DUTIL is useful if you wish to change the encryption option on a drive without rebooting. Finally, DUTIL offers more sophisticated diagnostics and repair on a cartridge that has been in use and may be behaving unpredictably.

Other IDEA Software

All IDEA products work with Diskit 2 Plus. IDEAnet allows you to link up to 20 PCs and share printers and disk drives. IDEAshare allows you to link up to four PCs for the same purposes. IDEAmax 384 and IDEA

Supermax are cards with extra memory and ports for extending the productivity of your IBM. IDEA's 5251 communications products emulate terminals for the IBM System 34, 36, and 38. For a complete list of products, see Appendix C.

Section V:

DUTIL

DUTIL is an IDEA program that lets you format and prepare new cartridges, and perform test and repair procedures on cartridges and drives. It also allows you to add or remove encryption from a drive (provided the jumper on the Diskit 2 Plus card is set for encryption). DUTIL provides the functions of the IBM commands FDISK, FORMAT, and SYS, as well as a scan for bad sectors and a hard format.

DUTIL assumes that you have already run INSTALL to prepare a CONFIG.SYS file and a D2PLUS.SYS file or an AUTOEXEC.BAT file that are correct for your system.

For most of the functions mentioned above, you may also use INSTALL, which has a more interactive interface. Use DUTIL instead if you need more sophisticated diagnostics or batch mode.

The main menu for DUTIL looks like this:

```
==============================================
   IDEAssociates Diskit2+ DUTIL Program Rev.x
              Copyright (C) 1986

Drive 1 IDEAdrive #xx
Drive 2 IDEAdrive #xx

                  Main Menu Options

          F1  - Test Drive
          F2  - Bad Sector Scan
          F3  - Rebuild Drive (Hard Format)
          F4  - Partition Drive Function
          F5  - DOS Format Drive
          F6  - Complete Drive Format
          F7  - Copy System Files to Drive
          Esc - Exit to DOS

Messages:
==============================================
```

1. Use the up and down arrows to select drives. The drive currently selected is highlighted.

2. Messages appear for the function selected.

TIP

If you use DUTIL frequently, you will find it runs faster if you copy DUTIL.EXE and D2PLUS.SYS or PRIMARY.SYS and AUTOEXEC.BAT to one of your hard disks.

Overview of DUTIL Functions

To be usable, a new cartridge must have a hard format put on it (F3) to lay down tracks and sectors, which any operating system, including DOS, needs for use.

After a hard format, a DOS partition must be put onto the drive (F4) so that DOS, the PC's operating system, can use the cartridge.

If the IBM system is to start (boot) from a partition on a disk cartridge, the partition must be flagged as active (F4) if it is not already, and system files must be transferred to that partition (F7).

After prolonged use, it is normal for some sectors to become unusable. If a cartridge behaves unpredictably, DUTIL offers several means of testing and repair.

After partitioning, a DOS format (F5) may be used to mark bad sectors and remove them from use. This should be done only after saving any data on the cartridge, as the format destroys all data.

Testing of the drive (F1) may be done at any time, as it is not destructive.

Scanning for bad sectors (F2) may be done at any time on a cartridge that has been in use, even if it already has data on it. The scan may be done nondestructively, merely listing the number of bad sectors. The scan may, however, be used to mark bad sectors and remove them from use. In that case, information may be lost from the file.

Some of these functions require that you reboot the system before using the drive that DUTIL operated on. Rebooting is required by DOS when a drive was not loaded by DOS at startup before the DUTIL operation.

A sample series of steps on a new disk cartridge might be:

1 Run a test for hardware (F1).

2. Put a hard format on the disk (F3).

3 Put a DOS partition on the disk (F4, then F1))

4. Make the partition active (F4, then F2). This is done automatically if the partition covers the entire disk.

5. Reboot IBM PC.

6. Transfer system files to the partition (F7).

NOTE

Note that if you wish to execute steps F3, F4, an F5 together, you can simply choose F6 which combines these steps. The screen prompts for needed information as the systems steps through a hard format, partition of a drive, and formatting for DOS.

A sample series of steps on a cartridge that has been in use and is behaving unpredictably might be:

1. Run a test for hardware (F1). Correct any cabling or seating problems that are indicated.

2. If there are problems in the Seek/Read test but no problems are pointed out by the hardware test, scan for bad sectors (F2) without marking them.

3. If Step 2 showed more than 10 bad sectors, make a backup copy of the cartridge, then do a hard format on it. If the hard format is successful, prepare the cartridge for use as though it were a new cartridge (see the steps above).

4. If Step 2 showed fewer than 10 bad sectors, the problem may be a bad sector in a File Access Table or directory. Do a hard format. Then create a new DOS partition, skipping the first few cylinders on the drive.

F1 - Drive Diagnostics

This option runs tests on the hardware and cartridge of your Diskit 2 Plus system. When F1 is pressed from the Main Menu, this menu appears:

```
==========================================
   IDEAssociates Diskit2+ DUTIL Program Rev.x
              Copyright (C) 1986

Drive 1 IDEAdrive #xx
Drive 2 IDEAdrive #xx

                Drive Diagnostics Menu

                External Cable Test
                Controller Diagnostics
                Drive Connected Test
                Cartridge In Test
                Test Drive Ready Check
                Random Seek/Read Tests

    Messages:

 Strike any key to continue ... (ESC to quit)
==========================================
```

Each time you press any key, the next test is run, and the notice "Passed" or "Failed" is added to the name of that test in the menu. Most of the tests are very rapid. The seek/read tests take about one minute. Press ESC at any time to return to the Main Menu.

The message area indicates which test is currently running or finished. For the Seek/Read test, the message area shows the track currently being tested and the number of tracks remaining, for example:

```
==========================================
Messages:  Random Seek/Read Test  132/500
==========================================
```

If there is a bad sector in the File Allocation Table (FAT) or the directory (DIR), you see the message:

```
==================================================
Trouble in the system area <FAT> <DIR>.
        Repair may be possible, but could cause loss of data. Please
        check that cables and cartridge are correctly and firmly
        inserted, then run DUTIL again.  Back up all data from the
        cartridge.

        F1 to attempt system repair   ESC to quit
==================================================
```

If you choose F1, you see:

```
==================================================
Doing track format and read test ... Please wait ...

Copying FAT from saved FAT...
(or, Reinitializing sector in DIR)

Reinitialization <copy> successful -- Please reboot
==================================================================
```

If the procedure is not successful, you see one of the following messages:

Reinitialization <copy> unsuccessful - Please hard format the disk and reload your files from backup copy.

Unable to locate FAT
Saved FAT is corrupted
Unable to reinitialize sector in DIR

F3 - Hard Format (Rebuild) the Drive

This option marks tracks and sectors on the cartridge, which are needed by any operating system. Use a hard format on a new cartridge or on a cartridge that is behaving unpredictably.

Press F3 from the Main Menu to get this screen:

```
================================================
      IDEAssociates Diskit2+ DUTIL Program Rev. x
                  Copyright (C) 1986

Drive 1 IDEAdrive #xx
Drive 2 IDEAdrive #xx

                Drive Hard Format Menu

About to Hard Format Drive x (ALL data will be lost!)

                Are you sure (Y/N)? [N]

================================================
```

An answer of N returns you to the Main Menu. An answer of Y with a return leads to this message:

```
================================================
Hard Formatting Drive x ... Please wait ...

Hard Format Complete.
        Strike any key to continue (ESC to quit)
================================================
```

A hard format takes three to five minutes.

Before this drive is usable by DOS, it needs a DOS partition (F3 from the Main Menu).

F4 - Partition Drive Functions

These functions are similar to those of the IBM utility FDISK, which prepares new disks for use with DOS. A partition is a division of the disk that appears to DOS as a whole drive and contains some information for DOS at the beginning.

When F4 is chosen from the Main Menu, you get this screen:

```
================================================
      IDEAssociates Diskit2+ DUTIL Program Rev.x
                  Copyright (C) 1986

Drive 1 IDEAdrive #xx
Drive 2 IDEAdrive #xx

                Drive Partitioning Menu

         F1  - Create DOS Partition
         F2  - Change Active Partition
         F3  - Delete DOS Partition
         F4  - Display Partition Data
         ESC - End Drive Partition Functions


    Messages:

================================================
```

Users of the DOS utility FDISK already know how to use these functions. They are described in full below.

F1 Create DOS Partition: This function puts a DOS partition on the drive so DOS can use it. It requires that the drive be hard formatted, and not already have a DOS partition.

On a Diskit 2 Plus drive, you may create one DOS partition and one or more other partitions for use with other operating systems.

If you choose this option and your drive is ready for a DOS format, you get the query:

```
==============================================
  IDEAssociates Diskit2+ DUTIL Program Rev.x
              Copyright (C) 1986

Drive 1 IDEAdrive #xx
Drive 2 IDEAdrive #xx

          Create DOS Partition Menu

Do you wish to use the entire fixed disk
for DOS (Y/N).................?[Y]

Messages:

            Press ESC to continue
==============================================
```

An answer of Y with a return leads to the partition display on the next page, showing one partition using all available cylinders. An answer of N requires further information from you.

Usually you should use the whole partition, as you can have only one DOS partition on a drive. Use part of a partition if:

- You have or will have other partitions (such as CP/M) on the drive.

- You know that part of the drive is damaged and wish to avoid using that part.

If you choose only part of a partition (with N in the menu above), you are queried for size in cylinders and for starting and ending cylinder, with the default being the largest possible block available:

```
========================================

Enter partition size .....[max]
Enter starting cylinder no[    ]

========================================
```

If the numbers entered are not consistent with the size available, DUTIL displays an error message. Use the backspace, delete, or left arrow key to enter new information.

You must be sure that the total size chosen is not more than the drive size, and that the starting and ending cylinder numbers are consistent with the size you want. If there is an inconsistency, DUTIL does not let you proceed.

If there is already one non-DOS partition on the drive and you accept the default by entering Y, DUTIL will create a partition as large as the largest unused block of sectors on the drive. You cannot create a partition that uses sectors on both sides of an existing partition.

One cylinder on a Type 12 drive contains approximately .Ø17 MB.

When the partition is created, DUTIL displays information similar to the following:

```
==========================================
  IDEAssociates Diskit2+ DUTIL Program Rev.x
            Copyright (C) 1986

Drive 1 IDEAdrive #xx
Drive 2 IDEAdrive #xx

                                      Size in
Partition  Status  Type  Start  End  Cylinders
   1         A      DOS     0   529    530
   2         N    non-DOS 530   610     81

      Total disk space is 611 cylinders

==========================================
```

The status is A for active, or N for not active. (If there is more than one partition, only one can be active at once.) Partition types are DOS and non-DOS.

In this example, both partitions are on one drive. To view partitions on the other drive, move the up and down arrows to select the other drive.

F2 **Change Active Partition Display:** This option of the Drive Partitioning Menu allows you to change the partition that you want to be active. You need this function if you have more than one partition on a disk. If INSTALL or DUTIL creates one partition that covers the entire cartridge, it also makes that partition active automatically.

Pressing F2 causes a screen to appear that is similar to the one below:

```
==============================================

  IDEAssociates Diskit2+ DUTIL Program Rev.x
            Copyright (C) 1986

Drive 1 IDEAdrive #xx
Drive 2 IDEAdrive #xx

        Change Active Partition Display
                                        Size in
 Partition  Status  Type  Start  End   Cylinders
    1         A      DOS      0   299    300
    2         N    non-DOS  400   599    200

      Total disk space is 611 cylinders

Enter the number of the partition you
want to make active ..............[ ]

 Messages:

            Strike ESC to continue

==============================================
```

F3 Delete DOS Partition: You might want to delete a DOS partition in order to create a new one of a different size.

When you select this option from the Drive Partitioning Menu, you get a partition display similar to that in the Active Partition Menu, with this message:

```
==============================================
 Warning!  ALL data in the DOS partition will be lost.
 Do you wish to continue (Y/N).................? [N]

==============================================
```

If you answer N, the program displays:

```
========================================
No Partitions are deleted

========================================
```

If you answer Y with a return, the program displays:

```
========================================
DOS partition deleted.

========================================
```

If the drive you are working with was not known and loaded by DOS at startup, DUTIL prompts you to reboot the system.

F4 **Display Partition Data:** This option of the Drive Partitioning Menu displays statistics about the drive or drives on one disk. To view statistics for the other disk, use the up and down arrows to select the other disk.

Here is a sample display:

```
================================================
   IDEAssociates Diskit2+ DUTIL Program Rev.x
              Copyright (C) 1986

Drive 1 IDEAdrive #xx
Drive 2 IDEAdrive #xx

             Partition Table Display

                                          Size in
 Partition   Status  Type  Start    End  Cylinders
    1          A     DOS        0   299     300

        Total disk space is xxx cylinders


             Strike ESC to continue
================================================
```

The status is A for active and N for nonactive. Types are DOS and non-DOS.

F5 - DOS Partition Format

Pressing F5 from the Main Menu gives you this screen, which puts a DOS or soft format on the drive. It assumes that the drive is hard formatted.

```
================================================
      IDEAssociates Diskit2+ DUTIL Program Rev.x
                  Copyright (C) 1986

Drive 1 IDEAdrive #xx
Drive 2 IDEAdrive #xx

               Dos Partition Format Menu

Formatting the DOS partition will lose ALL data
in the partition.  Are you sure (Y/N)>?  [ ]

Messages:

                  Strike ESC to continue
================================================
```

An answer of N returns you to the Main Menu. An answer of Y with a return causes this message to appear:

```
================================================
Formatting DOS Partition ... Please Wait

Format Complete ... xx Bad Sectors Found

================================================
```

Formatting requires only a few seconds.

After creating the DOS format, DUTIL queries whether you want to put a volume name on the cartridge. If you often change cartridges, the volume name helps distinguish them. The name may be up to 11 characters. See your DOS manual for volume names.

F6 - Complete Drive Format

Press F6 from the Main Menu Options screen to use this function. Complete Drive Format causes F3 (Rebuild Drive - Hard Format), F4 (Partition Drive Function), and F5 (DOS Format Drive) to be run in succession. However, the system prompts you for information as each function is carried out.

F7 - Copy System Files

When you enter F7 from the Main Menu, you get a screen that allows you to put the unlisted DOS system files on a partition. You can then use the Drive Partition Function to make that partition bootable. The partition must have:

- A DOS format
- At least two entries available at the beginning of the disk, plus two more entries anywhere on the disk, for new files (this means no more than 508 files on the root directory)
- No write-protect tab

DUTIL looks for the system files on Drive A, so there must be a DOS boot diskette in Drive A.

If the drive was not loaded by DOS at the last startup, DUTIL asks you to reboot before putting system files on the cartridge. This is a DOS requirement.

The screen displays:

```
================================================
    IDEAssociates Diskit2+ DUTIL Program Rev.x
                Copyright (C) 1986

Drive 1 IDEAdrive #xx
Drive 2 IDEAdrive #xx

                Copy System File Menu

Copying IBMBIO.COM ...
Copying IBMDOS.COM ...
Copying COMMAND.COM ...

Messages:  System transfer complete
                Strike ESC to continue
================================================
```

To boot from this partition:

1. Use F4 from the Main Menu and then F3 from the Drive Partitioning Menu to make the partition active if it is not active already.

2. Open the door to drive A and reboot.

Note that the particular files copied depend on whether Diskit 2 Plus is the only hard drive or whether it is your second hard drive.

Using the DUTIL Command Line

If you often prepare new cartridges for your system, you may prefer not to go through DUTIL's menu system. The command line provides a shortcut to the function you want.

Format: DUTIL n/o

n = drive number
o = option (more than one may be specified):

- /A - perform /T, /R, /F, /P on one cartridge
- /B - bad sector scan
- /C - check encryption on a drive
- /D - disable encryption on a drive
- /E - enable encryption on a drive
- /F - DOS format a drive that is already hard formatted
- /H - display help information
- /P - Create one active DOS partition
- /R - Hard format the drive
- /S - transfer system files from Drive A*
- /T - Test the drive
- /V - Query for a volume name

As in the corresponding menus, appropriate messages are displayed on the screen.

Examples:

DUTIL 1/S	transfers system files to Drive 1
DUTIL 2/R/F	puts a hard format and then does a DOS format on Drive 2

* After using the /S option, you must first reboot the PC with DOS in order to make the drive self-booting after formatting.

Section VI:

Encryption

Overview

Diskit 2 Plus provides encryption so that you can safeguard your files. Once encryption is invoked, you must know the key you used (up to 8 characters) or access to the file will be denied.

For your protection, IDEA has provided a double type entry key. That is, you are asked to type the key once. Next, you are asked to verify the key just typed by typing it again. This means that if you make a typing mistake when the key is entered either the first of second time, that key is not used. The key and the verification of that key must match. If they do not match, the system prompts that you have entered an invalid key.

CAUTION

THERE IS NO METHOD OF RECOVERY IF YOU FORGET THE KEY USED. Once a cartridge has been encrypted, you must enter the correct encryption key to access the data. Otherwise, the cartridge must be reformatted, thus losing the data.

Selecting/Deselecting Encryption

Diskit 2 Plus Card Jumper

If you do not wish to use encryption, set the jumper on the Diskit 2 Plus card as shown in Figure 2-7A in Section 2. If this is done, the Encryption Menu is not displayed (refer to Encryption Menu in this section) nor can encryption be selected or deselected by using DUTIL (refer to Encryption and DUTIL in this section).

To use encryption you must first set the jumper on the Diskit 2 Plus card to the correct position (refer to Figure 2-7B in Section 2).

Once the jumper is correctly set, each time you boot the Diskit 2 Plus card, the prompt given in Using the Encryption Menu in this section is displayed.

Using the Encryption Menu

The Encryption Menu is displayed each time you boot the PC if the jumper on the card is set to the encrypt position (refer to Figure 2-7B in Section 2).

The menu offers the following choices:

```
==============================================
    Your data encryption is enabled.  Choose
    1 of the following drive usages.

    F1  Drive 1 encrypted only
    F2  Drive 2 encrypted only
    F3  1 and 2 encrypted
    ESC  No drives encrypted

    Enter a selection>  <
==============================================
```

If you choose ESC, no drives are encrypted.

If you choose F1, F2, or F3 the following prompt is displayed:

Enter Encryption Key (ESC to Abort)

The encryption key can be up to 8 characters in any combination of alphabetic, numeric, or other keys with the exception of the ESC, RETURN, or DEL keys. Be careful when typing the encryption key you choose. Note that the actual key is never displayed. Instead, for ultimate security, as each character of the key is typed, an X appears on the screen.

After the encryption key is typed, the following message is displayed:

Verify Encryption Key (ESC to Abort)

You must type the same encryption key again. This provides a check to be sure that you did not make a typing error when entering the encryption key. Remember, IF YOU FORGET THE ENCRYPTION KEY YOU USED, YOU CANNOT ACCESS DATA ON ANY CARTRIDGE CONTAINING THE FORGOTTEN KEY.

If both the encryption and the verified key do not match, a prompt is displayed indicating that the encryption key is not verified. Enter the key again.

Encryption and DUTIL

Note that enabling or disabling encryption using DUTIL does not change anything on the cartridge. It only changes whether or not the encryption key is used for reading and writing to the physical Diskit 2 Plus drive.

As long as the jumper on the Diskit 2 Plus card is set for encryption (see Figure 2-7 in Section 2), and you entered an encryption key on the Encryption Menu (refer to Using the Encryption Menu in this section), you can use DUTIL to do the following:

1. enable encryption by typing DUTIL, the drive on which you wish to enable it, and E.

   If, for example, drive 1 is encrypted and drive 2 is not encrypted and you wish to activate encryption on drive 2, type the following at the DOS prompt:

   A> DUTIL 2/E <CR>

   For this example, the DOS A prompt was used. The 2 indicates drive 2, followed by a slash, and the E indicates encryption is enabled.

2. disable encryption by typing DUTIL, the drive on which you wish to disable it, and D.

   If, for example, drives 1 and 2 are encrypted and you want to disable encryption on drive 1, type the following at the DOS prompt:

   A> DUTIL 1/D <CR>

   For this example, the DOS A prompt was used. The 1 indicates drive 1, followed by a slash, and the D indicates that encryption is disabled.

3. check whether encryption is active on a drive by typing DUTIL, the drive you wish to check, and C.

   If, for example, you want to know if drive 2 is encrypted, type the following at the DOS prompt:

   A> DUTIL 2/C <CR>

   For this example, the DOS A prompt was used. The 2 indicates drive 2, followed by a slash, and the C indicates you wish to conduct a check.

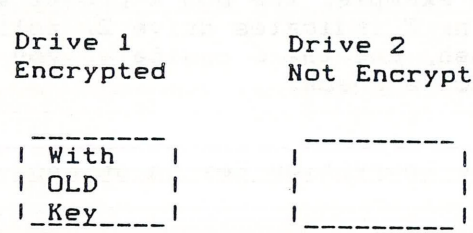
Changing the Encryption Key on an Encrypted Cartridge

If you have an encrypted cartridge you may want to change the encryption key for that cartridge. For example if an employee leaves the company you may want to change the work he encrypted to a new key, or you may wish to transport an encrypted cartridge from one location to another where information is added or changed. The cartridge could then be encrypted for a different key in order to safeguard the new information from being accessed by the original sender. You may need to change the key if the present encryption key becomes known to too many people.

Although a cartridge cannot have its key changed (unless you reformat the cartridge which destroys all data on it), you can copy its contents to an unencrypted drive, then copy that information to a drive with a new encryption key. To do this you must know the encryption key on the cartridge to be changed.

The procedure for changing a key is as follows:

1. Encrypt drive 1 with the encryption key already on the encrypted cartridge. This is done by rebooting the PC in order to display the Encryption Menu. On the Encryption Menu choose F1 (encrypt drive 1 only), enter the encryption key that is on the cartridge. Do not encrypt drive 2.

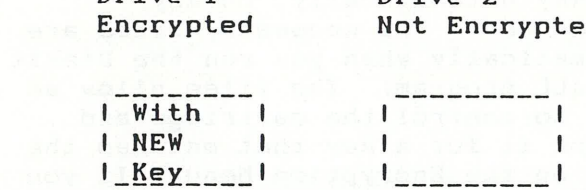


2. Place the encrypted cartridge in the encrypted drive (drive 1) and place a new formatted cartridge in the unencrypted drive (drive 2).

3. Use the COPY command (do not use BACKUP) to copy the contents of drive 1 to drive 2. After the copy has finished, the contents of the cartridge on drive 2 are not encrypted.

4. Remove the encrypted cartridge from drive 1 and replace it with a cartridge that has been formatted with the new key. Refer to Formatting a Cartridge with an Encryption Key in this section.

5. To encrypt the contents of the cartridge on drive 2 to a new encryption key, reboot your PC to access the Encryption Menu. Choose option F1 (encrypt drive 1 only) then enter the new encryption key. Do not encrypt drive 2.



6. Use the COPY command (do not use BACKUP) to copy the contents of drive 2 to drive 1. After the copy has finished, the contents of the cartridge on drive 1 is encrypted with the new key.

Formatting a Cartridge with an Encryption Key

To format a cartridge with an encryption key, reboot the PC in order to display the Encryption Menu. Choose F1 (encrypt drive 1), F2 (encrypt drive 2), or F3 (encrypt drives 1 and 2). Enter the encryption key you want to use and verify it.

To format the cartridge for that key, place the cartridge in the encrypted drive and use the DUTIL format command to format the cartridge.

For example, type the following at the DOS prompt:

```
A> DUTIL 1/R/P/F <CR>
```

where 1 stands for drive 1 and R, P, F are the format commands.

Backing up to a Cartridge

There are a number of ways to back up data. Refer to Section IV for information.

Determining Whether a Cartridge Contains the Correct Encryption Key

IDEA provides a means of checking the encryption key automatically on any cartridge you use. The necessary files are set up automatically when you run the Diskit 2 Plus INSTALL program. The files allow an IDEA driver to control the cartridge and thereby check it for a key that matches the one entered on the Encryption Menu. If you do not run the INSTALL program, be sure that you set up the files listed below.

If you are using a Secondary Address, use a text editor to add the following to your CONFIG.SYS file:

```
DEVICE = D2PLUS.SYS
```

If you are using a Primary Address, use a text editor to add the following to your AUTOEXEC.BAT file:

```
PRIMARY.COM
```

Make sure that you have a copy of the IDEA PRIMARY.COM file on your PC.

Once the correct device driver (PRIMARY.COM or D2PLUS.SYS) is installed, each time you place a cartridge in drive 1 or drive 2, the master boot record on the cartridge is read to determine whether the cartridge is encrypted and if so, whether the key matches the key in the Encryption Menu.

Questions About Encryption: What happens If?

1. You put an encrypted cartridge in a non-encrypted drive on bootup?

   You will see- "Bad Signature, Master Boot Record on Drive X, Skipping..."

   What to do- Reboot the PC selecting the correct encrypted drive for the correct encrypted cartridge.

2. You put a non-encrypted cartridge in an encrypted drive on bootup?

   You will see- "Bad Signature, Master Boot Record on Drive X, Skipping..."

   What to do- Reboot the PC selecting the correct non-encrypted drive for the correct non-encrypted cartridge.

3. You disable encryption on an encrypted cartridge by running DUTIL?

   You will see- When trying to access that drive "Non-DOS disk error reading drive X
   Abort, Retry, Ignore?

   What to do- Run DUTIL and enable encryption on that drive.

4. You enable encryption on a non-encrypted cartridge by running DUTIL?

   You will see- When trying to access that drive "Non-DOS disk error reading drive X
   Abort, Retry, Ignore?

   What to do- Run DUTIL and disable encryption on that drive.

5. You move an encrypted cartridge to a non encrypted drive and try to access the cartridge?

   You will see- When trying to access that drive "Non-DOS disk error reading drive X
   Abort, Retry, Ignore?

   What to do- Move encrypted cartridge back to the proper encrypted drive.

6. You move a non-encrypted cartridge to an encrypted drive and try to access the cartridge?

   *You will see- When trying to access that drive "Non-DOS disk error reading drive X
   Abort, Retry, Ignore?

   What to do- Move non-encrypted cartridge back to the proper non-encrypted drive.

7. You boot-up the PC with an encrypted cartridge in one drive and select the ESC key for No drives encrypted?

   You will see- The drive with the encrypted cartridge will say "Bad Signature, Master Boot Record on Drive X, Skipping...

   What to do- Reboot the PC and select the proper drive as encrypted.

8. You enter the wrong key for an encrypted cartridge on boot-up?

   You will see- "Bad Signature, Master Boot Record on Drive X, Skipping...

   What to do- Reboot the PC and enter the correct Key. If the correct Key is not known you will never have access to the data on that cartridge and it will have to be completely reformatted with a new Key.

Appendix A:

Messages

Messages from INSTALL

Bad Sector in Directory - Disk Unusable.
The cartridge you are using is bad. Insert a new cartridge and retry.

Cable check not satisfactory. Cannot detect cable or drives at end of cable.
The cable for Diskit 2 Plus may be bad, or may not be firmly connected either to the drive or to the controller board in the IBM. Turn off the system, check connections, and retry. If you still get this message, call your dealer.

Cabling - OK
The IDEA cable has passed the INSTALL diagnostic test.

Can't find DOS system files on diskette in drive A.
Please insert a DOS boot diskette in drive A and
strike any key.
INSTALL attempted to copy system files to a hard disk to make it bootable, but needs your DOS diskette in drive A in order to access the files required.

Cartridge is not readable.
The cartridge does not have a format that is recognizable by DOS. Check that the cartridge is firmly seated in the drive and is not write protected, and that power to the drive is on. Be sure that the encryption key on the cartridge matches the one on the drive. If you still get this message, try another cartridge or respond Y to INSTALL's offer to put a DOS format on the cartridge. In the latter case, data may be lost.

Cartridge <X> is write protected.
The cartridge has the plastic write-protect tab on it. Use a screwdriver or other instrument to remove the tab, reinsert the cartridge, and retry. Refer to Appendix B.

Controller - OK
The IDEA controller for Diskit 2 Plus has passed the INSTALL diagnostics.

Controller failed diagnostics
Check that the file D2PLUS.SYS is on the diskette in Drive A. If it is, there is a problem with the IDEA controller board. Call your dealer.

Copying IBMBIO, IBMDOS, and COMMAND.COM to C.
Modifying (or creating) CONFIG.SYS.
Installing IDEA driver on Drive C.
INSTALL is making Drive C bootable as you requested.

Copying IBMBIO.COM, IBMDOS.COM, and COMMAND.COM to C
INSTALL is making Drive C bootable as you requested.

Diagnostics Complete
The Diskit 2 Plus hardware has passed the INSTALL diagnostic tests.

```
Diskit 2 Plus Device Driver, version x.xx
Copyright (C) 1985, IDEAssociates, Inc.

Drive 1 IDEAdisk Type xx Recalibrating .. Drive Recalibrated.
Drive 1 IDEAdisk Type xx Loading ... Drive Loaded.
Drive 2 IDEAdisk Type xx Recalibrating ... Drive Recalibrated.
Drive 2 IDEAdisk Type xx Loading ... Drive Loaded
x logical disks allocated
```

This is the normal startup message once you have installed a third or fourth disk.

Do you have an IDEA controller installed (Y/N)?
INSTALL is unable to identify any IDEA controller. Be sure that the controller for Diskit 2 Plus is firmly seated in the IBM, and that all disk controllers are using the current revision of IDEA software. Check that jumper J1 is set correctly for the number of controllers with hard disks in your system. If you still get this message, call your dealer.

Drive <X> - OK
Disk Drive <X> passed INSTALL diagnostics.

Drive 2 - OK
Disk Drive 2 passed INSTALL diagnostics.

Drive 2 - Cartridge is readable
Drive 2 has a format that is recognizable by DOS.

Drive <X> is found not ready.
Drive <X> is not powered on, or the door is not firmly closed

Drive C is now bootable.
You can now start your system from this drive.

The cartridge in Drive X has a write-protect tab.
To remove the protection, use a screwdriver or other instrument to remove the tab.

Drive <X> not responding.
Drive <X> may not be powered on, or the IDEA cable may not be firmly connected. Check power and cabling and retry. If you still get this message, call your dealer.

Drive <x> passes all tests, but drive <y> does not. Do you wish to continue testing the cartridge in drive <x> only (Y, N)?
One of the drives does not pass all of the INSTALL diagnostic tests, but you can continue testing the other drive. If you know what is wrong with drive <X>, you may prefer to answer N, exit INSTALL, and correct the problem.

Failure to format the cartridge for DOS. Do you want to hard format the disk (Y/N)?
INSTALL is unable to put a format recognizable by DOS on the cartridge. Be sure that the encryption key on the cartridge matches the one on the drive. A hard format may rebuild the cartridge so that a DOS format can be put on it.

Format Complete ... XX bad sectors found.
INSTALL found XX bad sectors on the drive. For a new drive, more than 10 bad sectors indicate that you should replace the cartridge and try again. The bad sectors are marked not to be used and do not directly affect the use of the cartridge.

Formatting Drive ... Please Wait
INSTALL is rebuilding the drive. This takes from three to five minutes.

Formatting cartridge for DOS ... Please wait ...
INSTALL is putting a format recognizable by DOS on the cartridge. This takes from five to ten minutes.

Making new bootable disk for A
Put the IDEA diskette with D2PLUS.SYS on it in drive A.
Strike any key when ready.(This message appears only
if the IDEA diskette has been removed from Drive A.)
Place a DOS BOOT diskette in drive A:
Strike any key when ready.
Modifying <or creating> CONFIG.SYS file on drive A ...
Copying IDEA driver to drive A ...
IDEA driver installed on drive A.
INSTALL is adding IDEA software files to your boot diskette so that in the future you can boot from this diskette and DOS will know about the new drives you have added. Be sure that drive A has first the IDEA software diskette, than a DOS diskette that you will use to boot.

Modifying CONFIG.SYS file on drive C ...
Copying IDEA driver to drive C ...
IDEA driver installed on drive C.
INSTALL is making a previously installed hard disk bootable as you requested.

Modifying CONFIG.SYS file on drive C ...
Copying IDEA driver to drive C ...
Drive C already has a DOS system on it.
INSTALL is modifying previous Drive C so that DOS will know about the new drives at startup. Since Drive C already has a DOS system on it, it does not need to be made bootable again. The procedure has completed successfully.

No room for system files
The drive you want to make bootable has files in the first two locations where system files should be put.
You must reformat the drive, losing all data on it.

Still cannot match drive configuration.
Do you have another card installed (Y/N)?
INSTALL has found another controller card. Remove any other disk controller cards, and any boards from manufacturers other than IDEA. Retry.

The system must be rebooted before the drive
may be accessed through DOS.
INSTALL put a format recognizable by DOS on a cartridge in a drive that was just installed. DOS requires that the system be rebooted with CTRL-ALT-DEL before it uses the new drive.

This program is incompatible with the hardware.
Version x, product n, or mm/dd/yy is a mismatch.
Be sure that you have a copy of D2PLUS.SYS in Drive A and that you have the same version of software on the diskette and of the controller board. If you still get this message, call your dealer.

This program only works with IDEA products. Install the IDEA external controller and retry.
You answered N to the question, "Do you have an IDEA controller board installed?"

The two adapter/controller cards may accidentally have the same address.
You answered Y to the question, "Do you have another controller board installed?" If the board is from another manufacturer, there may be hardware conflicts. Remove the other board and retry. If you still get this message, call your dealer.

Unable to transfer system files.
INSTALL tried to make a disk bootable but could not read it. Try a DOS format with DUTIL, or insert another cartridge and rerun INSTALL.

You may make your external cartridge (C) bootable.
Since you do not have a previously installed hard disk, you may make your new Drive 1 bootable, so that you can start the system from it. If you do not choose to do this, you can exit INSTALL and continue to boot your system from a boot diskette in Drive A.

You may make your internal hard disk (C) bootable.
But, since it did not pass ALL of the drive diagnostics, you must correct whatever problem exists and rerun INSTALL.
INSTALL found problems in the hardware in your disk system, which are listed on the top half of the screen. Correct the problems and retry. If the problem persists, call your dealer.

You may make your internal hard disk (C) bootable.
Your hardware has passed all INSTALL diagnostics. You may use INSTALL to prepare your previously installed hard disk so that it starts the system and also recognizes the new drives. Or, you may add software to Drive A so that the boot diskette recognizes the new drives. You may also quit now and exit INSTALL, but it is preferable to let INSTALL modify either the hard disk or the diskette in Drive A so that the new drives are loaded properly in the future.

Messages from DUTIL

Can't find DOS on diskette in drive A
DUTIL looks for the system files in Drive A to transfer them to a partition. Place a boot diskette in drive A and press any key to continue.

The drive already has a DOS system on it
You tried to transfer system files to a drive that already has them.

Drive must have a DOS partition on it
You tried to put a DOS format on or transfer system files to a drive that needs a DOS format. Use F4 from the Main Menu

Drive unit unusable - system area has defect
Either the cartridge is defective and should be replaced, or it is being formatted with the wrong DOS version. For example, the system may have been booted with DOS 2.1, but INSTALL or DUTIL is being run from a diskette formatted with a later version of DOS.

Error writing Master Boot Record
The program could not write data, probably because the cartridge is write protected or is not hard formatted.

Error reading Master Boot Record
The program could not read data. Master Boot Record track may be damaged. Reformat the drive.

No DOS partition to activate
You tried to make a partition active, but there is no DOS partition on that drive. You must create one. Be sure you have selected the correct drive with the arrow keys.

No DOS partition to delete
There is no DOS partition on this drive. Be sure you have selected the correct drive with the arrow keys.

No room for system on drive
You tried to transfer DOS system files to a drive that has no more space in its directory. Delete the first three files on the drive and try again. If this does not work, you must reformat the drive, losing all data on it.

Partition x is already active
This drive is already active. If there is only one drive on a cartridge, IDEA software makes it active automatically.

Messages from IDEA at Startup

These messages may appear if you have a previously installed IDEA drive. They do not usually cause startup to fail.

IDEA 1701
The software expects a controller that cannot be found. Be sure that the controller is inserted in the IBM and cabled.

Bad Signature, Master Boot Record on Drive <x>, Skipping ...
Either Drive <x> is encrypted and the user entered the wrong key, or Drive <x> encryption is not properly enabled or disabled.

Invalid drive spec
This DOS message appears if you attempt to read a cartridge created with IBACKUP from DOS.

IBM Messages at Startup

XXXXX ROM ERROR (RESUME="F1")
This means that either 2 ROMS are at the same address or the one at the displayed address has a pin in wrong. This message is displayed when the checksum does not add up to zero.

Appendix B:

Care of Removable Cartridges

This appendix describes the regular maintenance procedures for Diskit 2 Plus cartridges. Regular maintenance should give you years of successful operation.

NOTE

Failure to take proper cleaning measures as outlined in this appendix may invalidate your warranty.

All removable cartridges must be hard formatted and have a DOS partition before use with DOS. Use INSTALL or DUTIL to perform these functions.

CAUTION

1. Before removing or inserting the cartridge, be sure the door is open to at least 90 degrees. Failure to do so can cause permanent head damage.

2. To remove a cartridge while the power is on, first push the button on the front of the drive. The access light will flash. Do not open the door until the light stops flashing. Opening the door early can damage the heads permanently. Press the button again when the light stops flashing to assure that the door is unlatched.

3. To insert a cartridge, take care that the cartridge does not damage the clips on the inside bottom of the drive. Tip the cartridge slightly up to insert it, or insert it flush against the inside top of the drive.

4. The cartridge is sensitive to shock and extreme temperature. Take care not to drop the cartridge. If the cartridge has been exposed to extreme heat or cold, you should allow it to stabilize at room temperature for one hour before trying to use it.

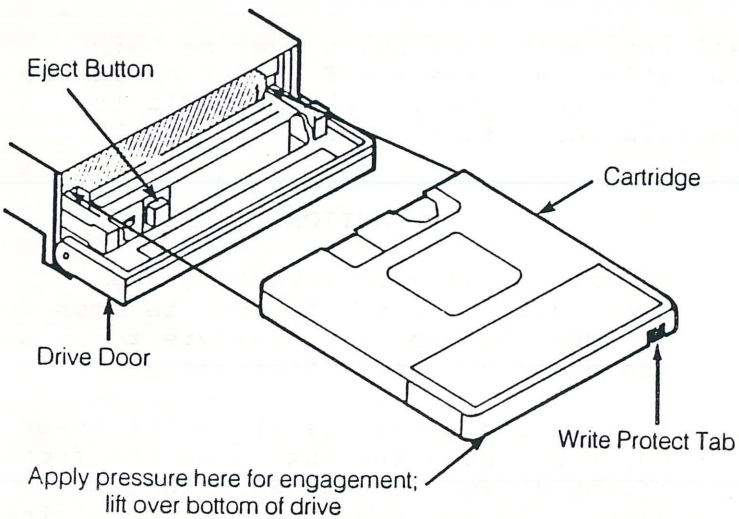


Figure B-1: Insertion of a Disk Cartridge

The Access Light

On the 10MB removable drive, the access light is green to signal that the drive is ready and red to signal startup, recalibration, error, or continued read/write access, and emits double flashes for a bad cartridge.

When the access light is off, cartridges may be inserted or removed.

The Write-protect Tab

The write-protect tab is a plastic tab (usually colored) on one side of the cartridge. On the 10MB cartridge, the write-protect tab must be removed before you write to or format the cartridge. The tab prevents accidental deletion of data when it is present.

It is helpful to use a small screwdriver or other metal tool to remove the tab.

Appendix C:

IDEA Products

For information or to order these products, contact your dealer or call IDEA at (800) 257-5027.

Communications Products

- IDEAcomm 5251 is the product that set the standard in twinax communications. It is a 5250 and 3180 emulator that provides local twinax communications from an IBM AT, PC, XT, or Portable to IBM System 34/36/38 minicomputers. It supports the greatest number of printer types in the market, including emulation of IBM 5224, 5225, 5256 and 5219 printers; and file transfer support for IBM's FSU, FTF, and PC Support/36 and 38. In addition, the IDEAcomm 5251 D card supports the full 32 display attributes of the 5251 screen.

- IDEA.5251/Share is a resource sharing software package that allows as many as four PCs to access a System 34/36/38 via an IDEAcomm 5251 card.

- IDEAcomm 5250/Remote allows remote connection to the System 34/36,38 via synchronous modem, with concurrent access for up to nine 5250 sessions. File transfer support for IBM's FSU, FTF, and PC Support/36 and 38 is included.

- IDEAcomm 3278 allows the IBM AT, PC, XT, or Portable to emulate all the functions of IBM 3278/3279 terminals, plus IRMA mode for compatibility with packages supporting the IRMA product. (IRMA is a trademark of Digital Communications Associates, Inc.)

- IDEAcomm 3287 is a printer emulation product that lets a local PC printer emulate an IBM 3287.

- IDEA Minicomm is a versatile communications card that allows communications over telephone lines to IBM mainframes. Four software packages are available:

  3270/SNA
  3270/BSC
  3770/SNA
  3780/BSC

Disks

IDEA's full line of personal computer hard disks is designed for the business environment where limited desk space is a fact of life. Extensive software is provided for formatting, partitioning, and backing up disks. Every disk product has IDEA's unique upgrade policy that allows users to trade up in capacity from one unit to another for the difference in price and a small handling fee. IDEA's disk line includes:

- Diskit 10 to 120 MB fixed drives for the XT and AT, which may be combined in one system with tape or removable Diskit for backup.

- Diskit 2 Plus, with all the features of Diskit 2, also offers encryption and image backup.

- IDEAdisk 5 to 120 MB external disks for the PC, AT, and XT, available with either tape or removable cartridge backup.

Networking and Modems

- IDEAshare is a software package that links up to four ATs, PCs, XTs, Portables, and PCjrs and allows them to share hard disks, printers, and data. It also features password protection, electronic messaging, and a modem link.

- IDEAnet is a local area network in a combined hardware/software package that links up to 20 users with password protection, print spooling, and shared files.

- IDEAcomm 2400 provides 300 to 2400 baud modem communications, automatic and software selectable, with auto answer and auto dial, Email, and VT100 and 3101 terminal emulation.*

* Fully Hayes compatible.

Multifunction Cards

- All Aboard is a complete multifunction card for the XT, including disk controller, EMS option, and graphics adapter board available in EGR or non-EGR versions. It also has serial and parallel ports and a clock.

- Overboard is a graphics adapter board available in EGA or non-EGA versions. It also has serial and parallel ports and a clock. If you already have an internal hard disk, Overboard provides all other basic functions for the XT.

The following products include IDEAmenu with diagnostics, print spooler, RAM floppy, and many additional programs.

- IDEA Supermax, a high performance multifunction board for the AT, features memory expansion from 0 to 4 MB, using either 64K or 256K RAM chips, with built in split memory addressing. Two serial and one parallel port are included. A daughterboard is available.

- IDEA Supermax/EMS is the only multi-function board for the IBM AT that gives you 4MB of memory plus two serial ports, a parallel port, conventional, extended, and expanded memory. It is designed to the Lotus/Intel/Microsoft expanded memory specification.

- IDEAmax 384 provides 64K to 384K of memory, with serial port, printer port, clock, and game port.

- IDEAmini is an I/O short card. Its options include one or two serial ports, printer interface, and a clock.

- IDEA Minimax, designed for the short slot in the IBM Portable, XT, or AT, lets you add up to 384K with a base board plus override card.

Graphics Products

- IDEAgraph is a high speed color graphics card with resolution from 512 x 512 to 1024 x 1024 pixels, for use with all PC compatible color monitors, available in 24 or 40 MHz with 128K or 256K of memory. Software includes a tutorial program and a library of graphics primitives for interface to many programming languages. A palette of 4096 colors and analog, digital, and composite video outputs are standard.

Appendix D

Glossary

Active -- used of a partition or portion of a drive that is recognized by the operating system. The term active has meaning only for a disk that has more than one partition. Only one partition on a Diskit 2 cartridge can be active at once.

Adapter -- A board that plugs into the PC system board and connects via cable with a device controller.

Backup
A duplicate copy of data kept for security measures.

Batch file
A file that contains batch commands. It is faster to run than retyping the commands each time. Such filenames end with the extension .BAT.

Boot
To bring up or restart the IBM. A diskette or drive is **bootable** if it contains the DOS files that will start the operating system

Bootable
Used of a diskette or disk to which command transfers at startup time.

Cartridge
A tape or sealed disk that can be removed from the tape or disk drive for storage.

Connector
The attachment at the end of a cable, by which it connects to the pins in another connector.

Controller
A board or card that runs a device such as a disk.

Disk controller
A hardware device that controls a physical disk drive.

Disk operating system (DOS)
An operating system for the IBM PC/XT/AT and Portable Computers.

Drive
In this manual, **disk**, **hard disk**, and **drive** are often used to designate the same thing: the hard disk drive manufactured by IDEAssociates. The product is actually an enclosed (Winchester) disk in a drive. Such a disk may be **fixed** or **removable**.

Driver
Software that controls a device. The file that loads such drivers for Diskit 2 Plus is D2PLUS.SYS.

File Allocation Table (FAT)
A reserved area of a disk containing information about the physical organization of the disk.

Fixed disk
A hard disk that cannot be removed from its drive.

Format
To prepare a disk so it can be used by DOS or another operating system. A hard format lays down tracks and sectors on a disk. A soft format notes sectors that are bad.

Hard disk
All disks manufactured by IDEAssociates are hard disks, as opposed to floppy disks. They may be either **fixed** or **removable.**

Logical drive
A logical portion of a physical disk drive. See **partition.**

MB
Abbreviation for megabyte (1 million bytes).

MBR (Master Boot Record)
This is part of the format information needed by DOS. Putting a DOS partition on a disk with DUTIL, or making it readable with INSTALL, ensures a correct MBR.

Partition
A portion of a hard disk that looks to DOS like a separate drive and has information at the beginning that makes it readable by DOS. For Diskit 2, usually a partition covers an entire cartridge.

Read/Write Head
The component of a disk drive that senses the signals recorded on the magnetic media.

Reboot
To bring up the operating system, usually without turning off power. This is accomplished by pressing the Ctrl, Alt and Del keys simultaneously.

ROM
Read only memory, usually a chip used for hardware
configuration in a system.

Sector
A 512-byte portion of a disk.

Spooling
Simultaneous Peripheral Operations On-Line. It is the process of allowing programs using slow output devices (such as printers) to store data for later transmission, thus speeding program execution.

Unformatted disk
A disk that has not been initialized for use with DOS.

Utility
A program that provides general purpose functions for a system.

Winchester disk
A disk that is sealed against environmental damage.

Appendix E

Customer Support Information

Upgrade Policy

IDEA's upgrade policy allows you credit for 100% of the current selling price of your product, minus a small handling fee, toward the purchase of a higher capacity disk during the one year warranty period. To obtain an upgrade, return to the dealer where your product was purchased. If this is not possible, call the IDEA Technical Support Department at (800) 257-5027 to make arrangements for an upgrade.

If your product is beyond the one year warranty period, IDEA will credit you with a percentage of the selling price. Check with the IDEA Technical Support Department for details.

Repair Policy

If your product is still under the original one year limited warranty, IDEA will repair or replace it at no charge. If the product is out of the warranty period, IDEA will repair it and charge you on a time and materials basis.

If you are having problems with your IDEA product, take the following steps:

1. Call your dealer for assistance.

2. If your dealer is not able to provide a solution, call the IDEA Technical Support Department at (800) 257-5027. Be sure that you have the serial numbers from your software diskette and from your IDEA hardware.

   If the Technical Support representative determines that your product requires factory service, you will be given a Materials Return Authorization (MRA) number by Technical Support. IDEA will not accept returned products without an MRA number.

3. Box the product in the original shipping container or other secure package. Write your MRA number on the top of the box. For all warranty repairs, enclose a copy of the original purchase receipt as proof of date of purchase.

4. Ship by the most economical means to:

   IDEAssociates, Inc.
   29 Dunham Road
   Billerica, MA 01821
   MRA #_____

When you ship this product, you agree to insure the product or assume risk of loss or damage in transit and to prepare shipping charges to the factory.

Once your product has been repaired, IDEA will return it to you by UPS or the most economical carrier at IDEA's expense.

Warranty Card

Please complete and promptly return the enclosed warranty card. The warranty card should be filed by the party who installs the IDEA product.

Limited Warranty

For IDEAssociates' Limited Warranty, see page iii of this manual.

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